Replace Boiler Plant Generator

VAMC Building 7 / 9

Project No. 558-11-102FCA

Department of Veterans Affairs Medical Center 508 Fulton Street, Durham, North Carolina

Architect:
Roughton Nickelson De Luca Architects, PA
Durham, North Carolina

Owner: Veterans Affairs Medical Center Durham, North Carolina

Civil Engineer/Landscape Architect:

Coulter Jewell Thames, PA

Durham, North Carolina

PM&E Engineer:
Edmondson Engineers, PA

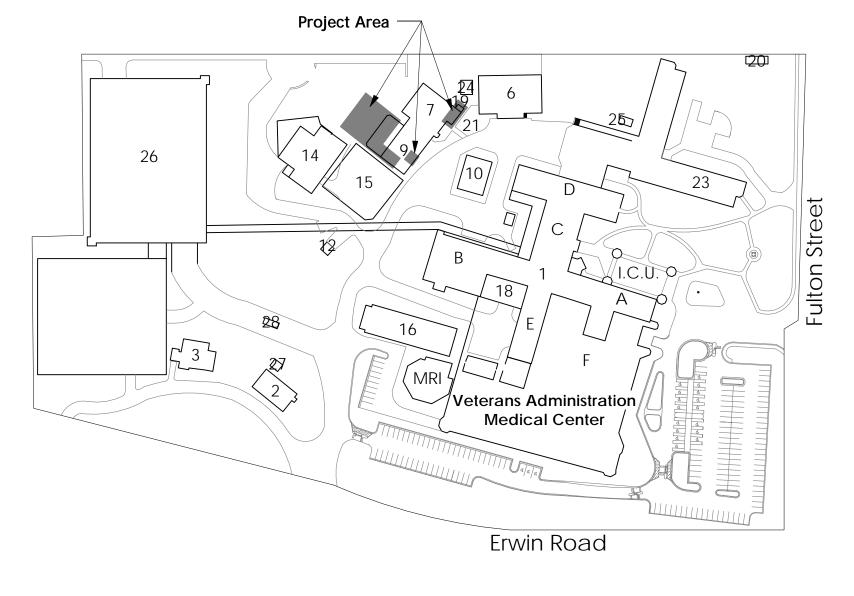
Asbestos Abatement: **S&ME, Inc.**Greensboro, North Carolina

Durham, North Carolina

G004 UL Fire-Resistance Ratings Designs G005 UL Joint System Designs G006 UL Through-Penetration Firestop Systems Hazardous Materials H101 Asbestos Abatement Plan C101 Existing Conditions and Demolition C102 Site Plan Architectural A101 Demolition Plans Plumbing P101 Plumbing Plans Mechanical M101 HVAC Demolition and Renovation Plans E001 Electrical Notes and Details E301 Electrical Riser Diagram E302 Electrical Panel Schedules and Details

Construction Documents

Key Plan



True Project
North North

STELSON - NICKELSON - DE LUCA
Architects, PA

Architects, PA

Sobrandia Notation of State 204

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Durham, NC 27707

To 19.490.1266 F 919.490.1396

Notation of State 204

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Construction Documents

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These of as such restricted publica	Irawings remain ed to the ition ther uction, o	on Nickelson De Li and specification the property of the original site for w e-of is expressly li r publication by a	ns are instruments ne architect. Thei rhich they were p mited to such use	of service and r use is repared and e. Re-use,
RE	ECC	MMEN	D APPF	ROVAL
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Chief of E	ngineerir	ng:		Date:
Associate	Date:			
Director:	Date:			
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Building N		Designed by:	Drawn by:	Checked by:
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7 &	9	GDL/STP	ISTP/RS	STP
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558-11-102FCA

DRAWING NO.

G001

21/2013 2:26

2012 APPENDIX B BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS (EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)

Name of Project: VAMC – Replace Boiler Plant Generator (VA Project No. 558-11-102FCA) Address: Veterans Affairs Medical Center, 508 Fulton Street, Durham, North Carolina Zip Code: 27705 Proposed Use: Same as existing; facility boiler and chiller plant, with addition of new emergency generator and associated electrical system equipment, and minor interior office alteration. Owner/Authorized Agent: VAMC/Charles Williams Phone: (919) 286-6922 ext 2292 E-Mail: charles.williams007@va.gov ☐ City/County ☐ Private ☐ State $oxed{oxed}$ VA Owned By: Code Enforcement Jurisdiction:

(Reproduce the following data on the building plans sheet 1 or 2)

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural:	RND Architects	Steven T. Pulling, AIA	11666	(919) 490-1266	steve@RNDarchitects.com
Civil:	Coulter Jewell Thames	Chuck Hill, PE	23461	(919) 682-0368	chill@cjtpa.com
Electrical:	Edmondson Engineers	Dennis Hayes.PE	028869	(919) 544-1936	dennis.haves@edmondsonengineers.com
Fire Alarm:	Edmondson Engineers	Dennis Hayes. PE	028869	(919) 544-1936	dennis.hayes@edmondsonengineers.com
Plumbing:	Edmondson Engineers	Charles Crowl, PE	028862	(919) 544-1936	charles.crowl@edmondsonengineers.com
Mechanical:	Edmondson Engineers	Charles Crowl, PE	028862	(919) 544-1936	charles.crowl@edmondsonengineers.com
Sprinkler- Standpipe:	N/A	N/A	N/A	N/A	N/A
Structural:	N/A	N/A	N/A	N/A	N/A
Retaining Walls	N/A	N/A	N/A	N/A	N/A

2012 EDITION OF NC CODE FOR	:	w Construction	Addition	☐ Fit-up
EXISTING: Reconstruction	n 🖂 Alt	eration	Repair	Renovation
BUILDING 7/9 (B-7/9)				
CONSTRUCTED: 1949 ORIGIN	AL USE(S) (Ch. 3):	(F-1) Steam Plant (Coal-Fired Boiler	s). (VA Building 7)
RENOVATED: <u>1971</u> REVISE	D USE(S) (Ch. 3):	(F-1) Steam Plant (Chiller Plant. (VA E		s) (VA Building 7) and addition of (F-1)
RENOVATED: <u>1989</u> CURRE	NT USE(S) (Ch. 3):	(F-1) Steam Plant (Plant. (VA Building		ed Boilers) and expansion of (F-1) Chiller
PROPO!	SED USE(S) (Ch. 3):	(F-1) Steam and Ch Equipment.	niller Plants, with	New Emergency Electrical System

2012 NC Building Code Summary

2012 NC Building Code Summary

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Construction Type: (check all that apply)	☐ I-A [☐ I-B [II-A	_ =	V-A V-B	
Sprinklers:	⊠ No □ F	Partial	Yes NFPA 1	3 NFPA 13R	NFPA 13D
Standpipes:	⊠ No □ Y	res Class: 🔲 I		Wet Dry	
Fire District:	⊠ No □ Y	⁄es			
Flood Hazard Area:	🛛 No 🔲 Y	⁄es			
Building Height: (feet) <u>42'</u>				
Gross Building Area:					
FLOOR		Building-7	7/9 Existing (Sq Ft)	New (Sq Ft)	SUB-TOTAL (SQ F
2 nd Floor:			N/A		
Mezzanine:		[293]			[293]
1 st Floor:		•	10 200		10.29

VAMC – Replace Boiler Plant Generator

	•	
lezzanine:	[293]	[293]
st Floor:	10,388	10,388
asement:	532	532
OTAL (Sq Ft)	10,920	10,920
	ALLOWABLE AREA	
ACCUIDANCY.		

	ALLOWABLE AREA
OCCUPANCY:	
Assembly: Business: Educational: Factory: Hazardous: Institutional:	□ A-1 □ A-2 □ A-3 □ A-4 □ A-5 □ □ □ F-1 Moderate (B-7/9) □ F-2 Low □ H-1 Detonate □ H-2 Deflagrate □ H-3 Combust □ H-4 Health □ H-5 HPM □ I-1 □ I-2 □ I-3 □ I-4 I-3 Condition: □ 1 □ 2 □ 3 □ 4 □ 5
Mercantile: Residential: Storage:	R-1 R-2 R-3 R-4 S-1 Moderate S-2 Low High-Piled Parking Garage Open Enclosed Repair Garage
Utility and Mi	scellaneous:
Accessory Occupa	ncies: N/A
Assembly: Business: Educational: Factory: Hazardous: Institutional: Mercantile: Residential: Storage: Utility and Mi	_
Incidental Uses (Ta	
Rooms wi Refrigerar Hydrogen Incinerato Paint shop Laborator Laundry ro	nom where any piece of equipment is over 400,000 Btu per hour input. The boilers where the largest piece of equipment is over 15 psi and 10 horsepower. The transport machine room. The cutoff rooms, not classified as Group H. The rooms. The company of the cutoff in occupancies of the room of the cutoff in a Group F. The cest and vocational shops, not classified as Group H. located in a Group E or I-2 occupancy. The company of the cutoff in a Group E or I-2 occupancy. The company of the cutoff in a Group E or I-2 occupancy. The company of the cutoff in a Group E or I-2 occupancy. The company of the cutoff in a Group E or I-2 occupancy. The company of the cutoff in a Group E or I-2 occupancy. The company of the cutoff in a Group E or I-2 occupancy. The company of the cutoff in a Group E or I-2 occupancy. The cutoff in a Group E or I-2 occupancy. The cutoff in a Group E or I-2 occupancy.

RND archit	ects – 1118 31	May 2013			VAM	C – Replace Boiler	Plant Generator
□ v	Vaste and linen co	ollection rooms	over 100 square feet.				
			ns having a liquid elect				m-ion capacity of
			ndby power, emergen	cy power, or unit	nterrupted powe	r supplies.	
_	Rooms containing Group I-2 storage i) sauare feet				
	Group I-2 storage i Group I-2 commer		square reet.				
	•		ss than 100 square fee	t.			
	•	•	ontain fuel-fired heatin				
Special Us	ses: 402 413 424	414		06	408 409 419 420		11
Special Pr	rovisions: 🗌 509	.2 509.3	509.4 509	.5 509.6	509.7	509.8 🗌 509.	.9 <u>N/A</u>
MIXED O	CCUPANCY: 🛛 N	o 🗌 Yes Se	eparation: Hr.	Exception: _			
☐ Ir	ncidental Use Sep This separat	•	5). ipt as a Non-Separated	Use (see except	ions).		
	Non-Separated Use			,	,		
	•	, ,	uction for the building	shall be determ	ined by applying	the height and a	rea
			applicable occupancies		ilding. The most	restrictive type	of
			d, shall apply to the er	-			
∐ S			w for area calculations. the occupancy shall be		um of the ratios o	f the actual floor	r area of each
			le floor area for each u			i tile actual 1100	alea of each
		,					
	Actual Area of	Occupancy A		ual Area of Occu			
	Allowable Area o	f Occupancy A	Allow	vable Area of Occ	сирапсу В		
			+		+ =		<u>≤</u> 1.00
					_		
CTORY	Description	(4)	(p)	(C)	(D)	(5)	(5)
Story No.	DESCRIPTION AND USE	(A) Bldg Area	(B) Table 503 ⁵ Area	(C) Area Increase	(D) Area Increase	(E) Allowable	(F) Maximum
110.	AND OSE	PER STORY	TABLE 303 TIMEA	FOR OPEN	FOR SPRINKLER	AREA OR	Building
		(ACTUAL)		Frontage $(I_f)^1$	$\left(I_{s}\right)^{2}$	Unlimited ³	AREA ⁴
1	F-1	10,388	(IIB/F-1) 15,500		N/A	22,165	44,330
-							
1 Frontag	To area increase f	rom Saction 50	6.2 is computed thus:				
			6.2 is computed thus: way or open space hay	ving 20 feet mini	mum width =	ft (F)	
a.		fronts a public	way or open space hav	ving 20 feet mini	mum width =	<u>ft</u> (F)	
a. b. c.	Perimeter which Total Building Per Ratio (F/P) =	fronts a public rimeter = <u>ft</u> (F/P)	way or open space hav (P)	ving 20 feet mini	mum width =	<u>ft</u> (F)	
a. b. c. d.	Perimeter which Total Building Per Ratio (F/P) = W = Minimum wi	fronts a public rimeter = <u>ft</u> <u>(</u> F/P) dth of public w	way or open space have (P) and P			<u>ft</u> (F)	
a. b. c. d. e.	Perimeter which Total Building Per Ratio (F/P) = W = Minimum wi Percent of fronta	fronts a public rimeter = <u>ft</u> <u>(F/P)</u> dth of public w ge increase I _f =	way or open space hav (P) ray = <u>ft</u> (W) 100[(F/P - 0.25) x W/3			<u>ft</u> (F)	
a. b. c. d. e. 2. The spr	Perimeter which Total Building Per Ratio (F/P) = W = Minimum wi	fronts a public rimeter = <u>ft</u> _ (F/P) dth of public w ge increase I _f = er Section 506.3	way or open space have (P) $fay = \frac{ft}{100}(W)$ $100[(F/P - 0.25) \times W/3]$ B is as follows:			<u>ft</u> (F)	
a. b. c. d. e. 2. The spr a. b.	Perimeter which Total Building Per Ratio (F/P) = W = Minimum wi Percent of fronta rinkler increase per Multi-story buildi Single story buildi	fronts a public rimeter = $$ ft (F/P) dth of public w ge increase I_f = er Section 506.3 ng I_s = 200 percing I_s = 300 perc	way or open space have (P) ay = $ft(W)$ $100[(F/P - 0.25) \times W/3]$ is as follows: tent cent			<u>ft</u> (F)	
a. b. c. d. e. 2. The spr a. b.	Perimeter which Total Building Per Ratio (F/P) = W = Minimum wi Percent of fronta rinkler increase per Multi-story buildi Single story buildi sed area applicable	fronts a public rimeter = $$ ft (F/P) dth of public w ge increase I_f = er Section 506.3 ng I_s = 200 perc ing I_s = 300 perc e under conditi	way or open space have (P) ay = ft (W) 100[(F/P - 0.25) x W/3 B is as follows: tent cent cons of Section 507.	80] =(9		<u>ft</u> (F)	
a. b. c. d. e. 2. The spr a. b. 3. Unlimit 4. Maximi	Perimeter which Total Building Per Ratio (F/P) = W = Minimum wi Percent of fronta rinkler increase per Multi-story buildir Single story buildir and area applicablum Building Area	fronts a public rimeter = $$ ft (F/P) dth of public w ge increase I_f = er Section 506.3 ng I_s = 200 perc ing I_s = 300 perc e under conditi = total number	way or open space have (P) ay = ft (W) 100[(F/P - 0.25) x W/3 B is as follows: cent cent cons of Section 507. of stories in the buildi	(so) =(so)	%)		control towers
a. b. c. d. e. 2. The spr a. b. 3. Unlimit 4. Maximo	Perimeter which Total Building Per Ratio (F/P) = W = Minimum wi Percent of fronta rinkler increase per Multi-story buildir Single story buildir and area applicablum Building Area	fronts a public rimeter =ft (F/P) dth of public w ge increase I _f = er Section 506.3 ng I _s = 200 percing I _s = 300 perce under conditi = total number pen parking gar	way or open space have (P) ay = ft (W) 100[(F/P - 0.25) x W/3 B is as follows: tent cent cons of Section 507.	(so) =(so)	%)		control towers

	Type: <u>IIB</u>				Type: <u>IIB</u>	
!	55		Feet = H + 20' = <u>N/A</u>		42	
	2		= <u>N/A</u>		1	
	IRE PRO	-			Design # son	Design # 505
SEPARATION DISTANCE (FEET)	R EQ'D	PROVIDED (W/_*_ REDUCTION)	AND SHEET #	FOR RATED ASSEMBLY	RATED PENETRATION	DESIGN # FOR RATED JOINTS
	0	0	N/A	N/A	N/A	N/A
≥ 30	0	0	N/A	N/A	N/A	N/A
≥ 30	0	0	N/A	N/A	N/A	N/A
5.15	1	1	Existing	N/A	N/A	N/A
≥ 30	0	0	N/A	N/A	N/A	N/A
	0	0	N/A	N/A	N/A	N/A
≥ 30	0	0	N/A	N/A	N/A	N/A
≥ 30	0	0	N/A	N/A	N/A	N/A
6.25	1	1	Existing	N/A	N/A	N/A
≥ 30	0	0	N/A	N/A	N/A	N/A
	0	0	N/A	N/A	N/A	N/A
	FIRE SEPARATION DISTANCE (FEET) ≥ 30 ≥ 30 5.15 ≥ 30 ≥ 30 ≥ 30 6.25	FIRE PROD FIRE SEPARATION DISTANCE (FEET)	FIRE PROTECTION REQU FIRE SEPARATION DISTANCE (FEET)	Stories + 1 = N/A	S5	S5 Feet = H + 20' = N/A 1

ALLOWABLE HEIGHT

VAMC – Replace Boiler Plant Generator

2012 NC Building Code Summary

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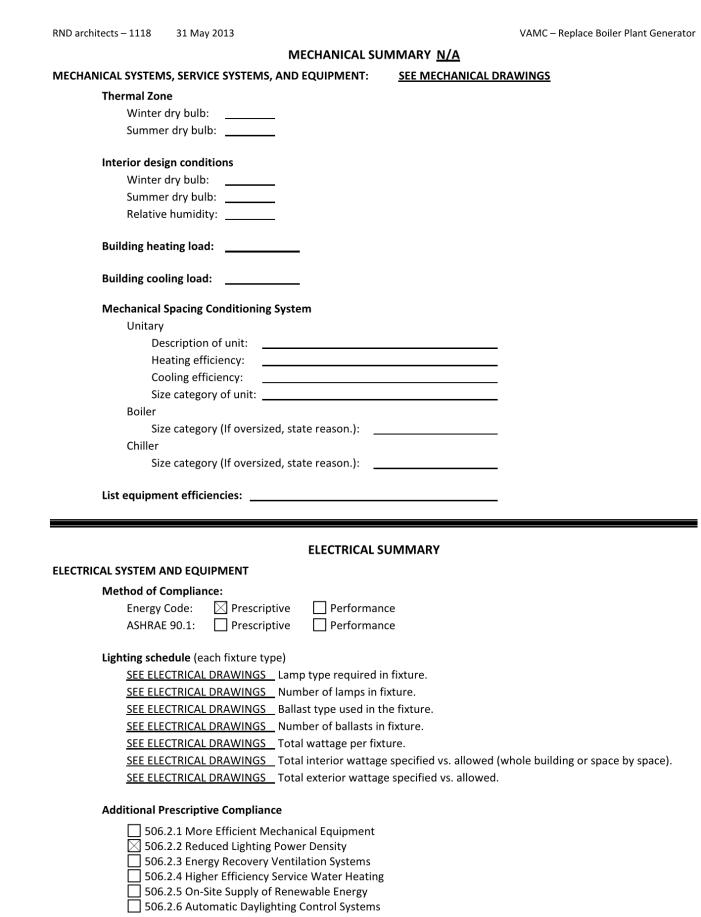
RND architects – 1118 31 May 2013

Structural Frame (including columns, girders, trusses):		0	0	N/A	N/A	N/A	N/A
Bearing Walls:							
Exterior:							
North:	≥ 30	0	0	N/A	N/A	N/A	N/A
East:	≥ 30	0	0	N/A	N/A	N/A	N/A
West:	5.15	1	1	Existing	N/A	N/A	N/A
South:	≥ 30	0	0	N/A	N/A	N/A	N/A
Interior:		0	0	N/A	N/A	N/A	N/A
Nonbearing Walls and Partitions: Exterior :							
North:	≥ 30	0	0	N/A	N/A	N/A	N/A
East:	≥ 30	0	0	N/A	N/A	N/A	N/A
West:	6.25	1	1	Existing	N/A	N/A	N/A
South:	≥ 30	0	0	N/A	N/A	N/A	N/A
Interior:		0	0	N/A	N/A	N/A	N/A
Floor Construction (including supporting beams and joists):		0	0	N/A	N/A	N/A	N/A
Roof Construction (including supporting beams and joists):		0	0	N/A	N/A	N/A	N/A
Shaft Enclosures – Exit:		1	N/A	N/A	N/A	N/A	N/A
Shaft Enclosures – Other:		1	N/A	N/A	N/A	N/A	N/A
Corridor Separation:		1	N/A	N/A	N/A	N/A	N/A
Occupancy Separation:		0	1	5/A301	U419	W-L-5047 W-L-1297 W-L-1176	HW-D-004 HW-D-004 WW-D-00
Party/Fire Wall Separation:		N/A	N/A	N/A	N/A	N/A	N/A
Smoke Barrier Separation:		N/A	N/A	N/A	N/A	N/A	N/A
Tenant Separation:		N/A	N/A	N/A	N/A	N/A	N/A
Incidental Use Separation:		N/A	N/A	N/A	N/A	N/A	N/A

RND architects – 1118 31 May 2013 VAMC – Replace Boiler Plant Generator RND architects – 1118 31 May 2013 VAMC – Replace Boiler Plant Generator LIFE SAFETY SYSTEM REQUIREMENTS ENERGY SUMMARY N/A **ENERGY REQUIREMENTS:** Emergency Lighting: Exit Signs: The following data shall be considered minimum and any special attribute required to meet the energy code shall also be Fire Alarm: provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance Smoke Detection Systems: method, state the annual energy cost for the standard reference design vs. annual energy cost for the proposed design. Panic Hardware: Climate Zone: 3 4 5 LIFE SAFETY PLAN REQUIREMENTS Method of Compliance: Life Safety Plan Sheet #: _____ Prescriptive (Energy Code) Fire and/or smoke rated wall locations (Chapter 7) Performance (Energy Code) Assumed and real property line locations (ASHRAE 90.1) Prescriptive Exterior wall opening area with respect to distance to assumed property lines (705.8) Performance (ASHRAE 90.1) Existing structures within 30' of the proposed building Occupancy types for each area as it relates to occupant load calculation (Table 1004.1.1) THERMAL ENVELOPE Occupant loads for each area Exit access travel distances (1016) Roof/ceiling Assembly (each assembly): Common path of travel distances (1014.3 & 1028.8) Description of assembly: Dead end lengths (1018.4) U-Value of total assembly: R-Value of insulation: Clear exit widths for each exit door Skylights in each assembly: Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.1) U-Value of skylight: Actual occupant load for each exit door Total square footage of skylights in each assembly: A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation Exterior Walls (each assembly): Location of doors with panic hardware (1008.1.10) Description of assembly: Location of doors with delayed egress locks and the amount of delay (1008.1.9.7) U-Value of total assembly: Location of doors with electromagnetic egress locks (1008.1.9.8) R-Value of insulation: Location of doors equipped with hold-open devices Openings (windows or doors with glazing) Location of emergency escape windows (1029) U-Value of assembly: Solar heat gain coefficient: The square footage of each fire area (902) Projection factor: The square footage of each smoke compartment (407.4) Door R-Values: Note any code exceptions or table notes that may have been utilized regarding the items above. ____ Walls below grade (each assembly): Description of assembly: ACCESSIBLE DWELLING UNITS (SECTION 1107) N/A U-Value of total assembly: _____ R-Value of insulation: TOTAL ACCESSIBLE ACCESSIBLE TYPE A UNITS TYPE B UNITS TYPE B UNITS TOTAL ACCESSIBLE Floors – over unconditioned space (each assembly): Description of assembly: U-Value of total assembly: ____ R-Value of insulation: ACCESSIBLE PARKING (SECTION 1106) N/A Floors – slab on grade: Number of Accessible Spaces Provided PROVIDED REGULAR WITH 5' VAN SPACES WITH Description of assembly: ACCESS AISLE 132" ACCESS AISLE 8' ACCESS AISLE PROVIDED U-Value of total assembly: R-Value of insulation: Horizontal/vertical requirement: Slab heated: ____

2012 NC Building Code Summary		5	2012 NC Building Code Summary
RND architects – 1118 31 May 2013		VAMC – Replace Boiler Plant Generator	RND architects – 1118 31 Ma
	STRUCTURAL DESIGN N/A		
DESIGN LOADS: Importance Factors: Wir	nd (L)		MECHANICAL SYSTEMS, SERVI
Sno			Thermal Zone
	smic (I _E):		Winter dry bulb
			Summer dry bul
Live Loads: Roo	of: PSF ezzanine: PSF		Interior design cond
Floo			Winter dry bulb
			Summer dry bul
Ground Snow Load:	PSF		Relative humidi
Wind Load: Bas	sic Wind Speed MPH (ASCE-7)		Duilding hoosts also
	posure Category		Building heating load
Wir	nd Base Shears (for MWFRS) Vx = \	/y =	Building cooling load
SEISMIC DESIGN CATEGORY:	A		
Provide the following Seismic Design P			Mechanical Spacing
Occupancy Category (Table			Unitary
Spectral Response Accelera		_ %g	Description
Site Classification (Table 163		⊒E □F	Heating eff Cooling eff
		Historical Data	Size catego
Basic structural system (che ☐ Bearing Wall	Dual w/Special Moment Frame		Boiler
Building Frame		reel	Size catego
☐ Moment Frame	e Inverted Pendulum		Chiller
Seismic base shear: V _X		7 D	Size catego
	Simplified Equivalent Lateral Force Components anchored? Yes No	Dynamic	
_	_		List equipment effici
LATERAL DESIGN CONTROL:	Earthquake Wind		
SOIL BEARING CAPACITIES:			
	est report): PSF		ELECTRICAL SYSTEM AND EQU
Presumptive Bearing Capacity Pile Size, Type, and Capacity			Method of Complian
File Size, Type, and Capacity	•		Energy Code:
SPECIAL INSPECTIONS REQUIRED:	Yes No		ASHRAE 90.1:
			Lighting schedule (ea
PLUN	MBING FIXTURE REQUIREMENTS (TABLE 2902.1)	N/A	SEE ELECTRICAL SEE ELECTRICAL
USE WATERCL		WERS/ DRINKING FOUNTAINS	SEE ELECTRICAL SEE ELECTRICAL
	FEMALE MALE FEMALE	UBS REGULAR ACCESSIBLE	SEE ELECTRICAL
SPACE EXISTING NEW	 	 	SEE ELECTRICAL
REQUIRED			SEE ELECTRICAL
		· · · · · · · · · · · · · · · · · · ·	SEE ELECTRICAL
			Additional Prescripti
	SPECIAL APPROVALS <u>N/A</u>		506.2.1 Mor
Special approval: (Local Jurisdiction, D	Department of Insurance, OSC, DPI, DHHS, ICC, etc., o	escribe below)	∑ 506.2.1 Mor
			506.2.3 Ener
			☐ 506.2.4 High
			I LEDE JE Om (

2012 NC Building Code Summary



2012 NC Building Code Summary

RECOMMEND APPROVAL

Chief of Police:

nergency Management:

Chief of Engineering: ssociate Director: Chief of Staff:

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Construction

DESCRIPTION

Documents

Building Code Summary

oproved Chief, Engineering Svc.

APPROVED BY:

MEDICAL CENTER DIRECTOR

Replace Boiler Plant

Generator 7 & 9 GDL/STP STP

VAMC - Durham 508 Fulton Street Durham, North Carolina 21 June 2013

Sheet of

558-11-102FCA 13-E-07

DRAWING NO. G002

Design No. U419 **BXUV.U419** Fire-resistance Ratings - ANSI/UL 263

Page Bottom

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or ssified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction. • Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.

• Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

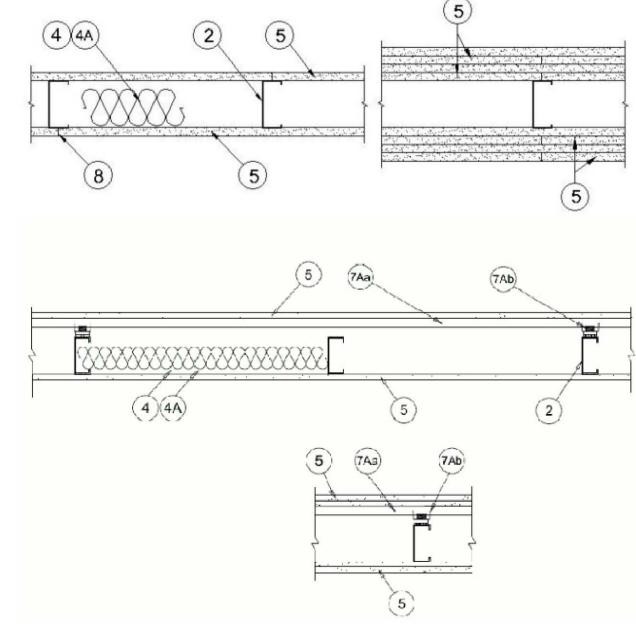
See General Information for Fire-resistance Ratings - ANSI/UL 263

Design No. U419

Fire-resistance Ratings - ANSI/UL 263

April 09, 2013

Nonbearing Wall Ratings - 1, 2, 3 or 4 Hr (See Items 4 & 5)



1. Floor and Ceiling Runners — (Not shown) — For use with Item 2 - Channel shaped, fabricated from min 25 MSG corrosionprotected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in.

1A. Framing Members* - Floor and Ceiling Runner — Not shown - In lieu of Item 1 — For use with Item 2B, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

CRACO MFG INC — SmartTrack™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™ Track

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper25™ Track

PHILLIPS MFG CO L L C — Viper25™ Track

1B. Framing Members* - Floor and Ceiling Runner — Not shown - In lieu of Item 1 — For use with Item 2C, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper20™ Track

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track

PHILLIPS MFG CO L L C — Viper20™ Track

1C. Framing Members*— Floor and Ceiling Runners — (Not shown) — In lieu of Item 1 - Channel shaped, attached to floor and

ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME Framing System

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME Framing System

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME Framing System

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System

UNITED METAL PRODUCTS INC — Type SUPREME Framing System

1D. Floor and Ceiling Runners - (Not shown)-For use with Item 2A- Channel shaped, fabricated from min 20 MSG corrosionprotected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners

1E. Framing Members*— Floor and Ceiling Runners — (Not shown, As an alternate to Item 1) — For use with Items 2E, 5F or 5G or 5I only, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.

CLARKDIETRICH BUILDING SYSTEMS — CD ProTRAK

DMFCWBS L L C — ProTRAK

MBA BUILDING SUPPLIES — ProTRAK

RAM SALES L L C — Ram ProTRAK

SOUTHEASTERN STUD & COMPONENTS INC — ProTRAK

STEEL STRUCTURAL SYSTEMS L L C — Tri-S ProTRAK

1F. Framing Members* - Floor and Ceiling Runner — Not shown - In lieu of Item 1 — For use with Item 2F, proprietary channel shaped runners, minimum width to accommodate stud size, with 1-1/8 in, long legs fabricated from min 0.015 in, (min bare metal thickness) galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

SUPER STUD BUILDING PRODUCTS — The Edge

STUDCO BUILDING SYSTEMS — CROCSTUD Track

1G. Framing Members* - Floor and Ceiling Runner — For use with Item 2G, proprietary channel shaped runners, minimum width to accommodate stud size attached to floor and ceiling with fasteners 24 in. OC max.

1H. Floor and Ceiling Runners — (Not shown) — Channel shaped, fabricated from min 0.02 in. galv steel, min width to accommodate stud size, with min 1 in. long legs, for use with studs specified below and fabricated from min 0.02 in. galv steel or thicker, attached to floor and ceiling with fasteners spaced max 24 in. OC.

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track VT100.

1I. Framing Members* - Floor and Ceiling Runners - (Not shown, As an alternate to Item 1) - For use with Items 2H, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with TELLING INDUSTRIES L L C - TRUE-TRACKTM

1J. Framing Members* - Floor and Ceiling Runner — Not shown - In lieu of Item 1 — For use with Item 2I, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

1K. Framing Members* - Floor and Ceiling Runner — Not shown - In lieu of Item 1 — For use with Item 2J, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel, attached to floor and ceiling with

TELLING INDUSTRIES L L C — Viper20[™] Track

TELLING INDUSTRIES L L C — Viper25[™] Track

2. Steel Studs — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

2A. Steel Studs — (As an alternate to Item 2, For use with Items 5B, 5E, 5H and 5J) Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min depth, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

2B. Framing Members* - Steel Studs — (As an alternate to Item 2, For use with Items 5C or 5I) - Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a ½ in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.

CRACO MFG INC − SmartStud $^{\text{TM}}$

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper25™

PHILLIPS MFG CO L L C — Viper 25^{TM}

2C. Framing Members* - Steel Studs — Not shown - In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.020 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper20™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™

PHILLIPS MFG CO L L C — Viper 20^{TM}

2D. Framing Members*— Steel Studs — In lieu of Item 2 - Channel shaped studs, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height. **ALLSTEEL & GYPSUM PRODUCTS INC** — Type SUPREME Framing System

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME Framing System

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME Framing System

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System

UNITED METAL PRODUCTS INC — Type SUPREME Framing System

2E. Framing Members*— Steel Studs — (Not shown, As an alternate to Item 2) —For use with Items 5F or 5G or 5I only, channel shaped studs, min depth as indicated under Item 5F, 5G or 5I, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

CLARKDIETRICH BUILDING SYSTEMS — CD ProSTUD

DMFCWBS L L C — ProSTUD

MBA BUILDING SUPPLIES — ProSTUD

RAM SALES L L C — Ram ProSTUD

SOUTHEASTERN STUD & COMPONENTS INC — ProSTUD

STEEL STRUCTURAL SYSTEMS L L C — Tri-S ProSTUD

SUPER STUD BUILDING PRODUCTS — The Edge

TELLING INDUSTRIES L L C — Viper 20^{TM}

2F. Framing Members* - Steel Studs — Not shown - In lieu of Item 2 — proprietary channel shaped steel studs, minimum width indicated under Item 5, 1-1/4 in. deep fabricated from min 0.015 in. (min bare metal thickness) galvanized steel. Studs 3/8 in. to 3/4 in, less in lengths than assembly heights.

2G. Framing Members* - Steel Studs — Not shown - In lieu of Item 2 - proprietary channel shaped studs, minimum width indicated under Item 5, Studs to be cut 3/8 to 3/4 in less than the assembly height. STUDCO BUILDING SYSTEMS — CROCSTUD

2H. Framing Members*— Steel Studs — (Not shown, As an alternate to Item 2) — Fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height. TELLING INDUSTRIES L L C — TRUE-STUD $^{\text{TM}}$

2I. Framing Members* - Steel Studs — (As an alternate to Item 2, For use with Items 5C or 5L) - Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a ½ in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only. **TELLING INDUSTRIES L L C** — Viper25™

2J. Framing Members* - Metal Studs — Not shown - In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.020 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights

3. Wood Structural Panel Sheathing — (Optional, For use with Item 5 Only.)- (Not Shown) - 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108. manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min, head diam, of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, fastener lengths for gypsum panels increased by

4. Batts and Blankets* — (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified

4A. Batts and Blankets* — (Optional) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. See Batts and Blankets (BKNV or BZJZ) Categories for names of Classified companies.

5. **Gypsum Board*** — Gypsum panels with beyeled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over study and staggered one stud cavity on opposite sides of study. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of study need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2C, 2D, 2F and 2G	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	1 layer, 5/8 in. thick	Optional
1	2-1/2	1 layer, 1/2 in. thick	1-1/2 in.
1	1-5/8	1 layer, 3/4 in. thick	Optional
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
2	3-1/2	1 layer, 3/4 in. thick	3 in.
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	2 layers, 3/4 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional
4	2-1/2	2 layers, 3/4 in. thick	2 in.

CGC INC - 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX or WRC; 3/4 in. thick Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO -1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SGX, SHX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR; 3/4 in. thick Types IP-X3 or ULTRACODE

USG MEXICO S A DE C V -1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Types IP-X3 or ULTRACODE

When Item 7B, Steel Framing Members*, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) shall be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in Item 6.

5A. **Gypsum Board*** — (As an alternate to Item 5) — 5/8 in. thick, 24 to 54 in. wide, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 6.

UNITED STATES GYPSUM CO — Type FRX-G, SHX.

USG MEXICO S A DE C V — Type SHX.

CGC INC — Type SHX.

5B. Gypsum Board* — (Not Shown) - As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 in or ¾ in. thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 in. or ¾ in. may be used as alternate to all 5/8 in. or ¾ in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or ¾ in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to 20 MSG steel studs Item 2A with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 11) or Lead Discs or Tabs (see Item 12).

RAY-BAR ENGINEERING CORP — Type RB-LBG

5C. Gypsum Board* — (For Use With Item 2B) Rating Limited to 1 Hour. 5/8 in. thick, 48 in. wide, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. (Vertical Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. Vertical joints are to be centered over studs and staggered one stud cavity on opposite sides of studs. (Horizontal Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. All

horizontal joints are to be backed as outlined under section VI of Volume 1 in the Fire Resistive Directory.

CGC INC — Type SCX.

UNITED STATES GYPSUM CO — Type SCX, SGX.

USG MEXICO S A DE C V — Type SCX.

5D. **Gypsum Board*** – (As an alternate to Item 5) - 5/8 in. thick, 48 in. wide, applied vertically or horizontally. Secured as described in Item 6. For use with Items 1 and 2 only.

UNITED STATES GYPSUM CO — Type USGX.

5E. Gypsum Board* — (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or No. 6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.

NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Nelco

5F. **Gypsum Board*** — (As an alternate to Item 5) — For use with Items 1E and 2E and limited to 1 Hour Rating only, Gypsum panels with beveled, square or tapered edges, applied vertically, and fastened to the steel studs with 1 in. long Type S screws spaced 8 in. OC along vertical and bottom edges and 12 in. OC in the field. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Steel stud depth shall be a minimum 3-5/8 in.

UNITED STATES GYPSUM CO - 5/8 in. thick Type SCX, SGX.

5G. **Gypsum Board*** — (As an alternate to Item 5) — For use with Items 1E and 2E only, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally, as specified in the table below and fastened to the steel studs as described in Item 6. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 2 hr, 3 hr and 4 hr ratings are as

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Item 2E	No. of Layers & Thickness of Panel	Min Thkns of Insulation (Item 4)
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR;, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in.

UNITED STATES GYPSUM CO - 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type SCX, SGX, SHX, IP-X1, AR, C, , FRX-G, IP-AR, IP-X2, IPC-AR: 3/4 in, thick Types IP-X3 or ULTRACODE

USG MEXICO S A DE C V − 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE

5H. Gypsum Board* — (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 or 3/4 in thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 11A) or Lead Discs (see Item 12A).

MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

51. Gypsum Board* — (As an alternate to Item 5) - Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges installed as described in Item 5. Steel stud minimum depth shall be as indicated in Item 5.

CGC INC — Type ULX

 $\mathbf{USG}\ \mathbf{MEXICO}\ \mathbf{S}\ \mathbf{A}\ \mathbf{DE}\ \mathbf{C}\ \mathbf{V} - \mathsf{Type}\ \mathsf{ULX}$

UNITED STATES GYPSUM CO — Type ULX

5J. Gypsum Board* — (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in, placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

RADIATION PROTECTION PRODUCTS INC - Type RPP - Lead Lined Drywall

6. Fasteners — (Not shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). Single layer systems: 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. Two layer systems: First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer. Three-layer systems: First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. Four-layer systems: First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

7. **Furring Channels** — (Optional, not shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in, long Type S-12 steel screws. Not for use with Item 5A and 5E.

7A. **Framing Members*** — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. Furring Channels - Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5F

b. **Steel Framing Members*** — Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 1-1/2 in. minimum selfdrilling, S-12 steel screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.

PAC INTERNATIONAL INC — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75).

7B. **Framing Members*** — (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:

> a. Furring Channels — Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 5. Not for use with b. Steel Framing Members* — Used to attach furring channels (Item 7Ba) to one side of studs (Item 2)

only. Clips spaced 48 in. OC., and secured to studs with two No. 8 x 2-1/2 in. coarse drywall screws, one

through the hole at each end of the clip. Furring channels are friction fitted into clips.

KINETICS NOISE CONTROL INC — Type Isomax

7C. Framing Members* — Optional - Not Shown - Used as an alternate method to attach resilient channels (Item 7). Clips attached at each intersection of the resilient channel and the steel studs (Item 2). Resilient channels are friction fitted into clips, and then clips are secured to the steel stud with min. 1 in. long Type S-12 steel screws through the center hole of the clip and the resilient channel flange.

KEENE BUILDING PRODUCTS CO INC — Type RC Assurance.

7D. **Framing Members*** — (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in, OC perpendicular to study. Channels secured to study as described in Item b. Gypsum board attached to

b. **Steel Framing Members*** — Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.

furring channels as described in Item 6. Not for use with Item 5A and 5E.

joint compound may be omitted when gypsum panels are supplied with a square edge.

PLITEQ INC — Type GENIECLIP

8. Joint Tape and Compound — Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and

9. Siding, Brick or Stucco — (Optional, not shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

10. Caulking and Sealants* — (Optional, not shown) — A bead of acoustical sealant applied around the partition perimeter for

UNITED STATES GYPSUM CO — Type AS

11. Lead Batten Strips — (Not Shown, For Use With Item 5B) - Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5B) and optional at remaining stud locations. Required behind vertical joints.

11A. **Lead Batten Strips** — (Not Shown, For Use With Item 5H) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grades "A, B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5B) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". 12A. Lead Discs — (Not Shown, for use with Item 5H) Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or

12. Lead Discs or Tabs — (Not Shown, For Use With Item 5B) - Used in lieu of or in addition to the lead batten strips (Item 11) or

optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads

adhered over steel screw heads. Lead discs to have a purity of 99.9% meeting the Federal Specification QQ-L-201f, Grades "A, B, C

13. Lead Batten Strips — (Not Shown, For Use With Item 5E) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in, long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5E) and optional at remaining stud locations.

14. Lead Tabs — (Not Shown, For Use With Item 5E) 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5E) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

*Bearing the UL Classification Mark

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Construction

DESCRIPTION

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ief of Engineering: ociate Director:

ergency Management

UL Fire-Resistance Ratings

Designs APPROVED BY:

EDICAL CENTER DIRECTO **Replace Boiler Plant**

Generator 7 & 9 GDL/STP STP/RS

VAMC - Durham

508 Fulton Street

Durham, North Carolina 21 June 2013 558-11-102FCA 13-E-07

Drawing No.

Design No. U425 BXUV.U425 Fire-resistance Ratings - ANSI/UL 263

Design/System/Construction/Assembly Usage Disclaimer Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products, equipment, system, devices, and materials.

- Authorities Having Jurisdiction should be consulted before construction.

 Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
 Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

Fire-resistance Ratings - ANSI/UL 263

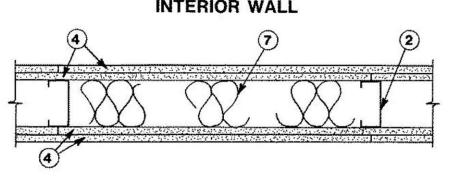
See General Information for Fire-resistance Ratings - ANSI/UL 263

Design No. U425

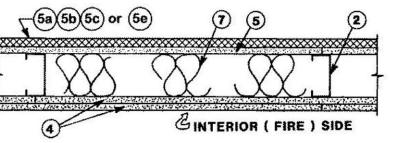
May 30, 2013 (For Exterior Walls, Ratings Applicable For Exposure To Fire On Interior Face Only, (See Items 4 and 5)

Bearing Wall Rating - 45 Min, 1, 1-1/2 or 2 HR.

(See Items 2 and 4) Load Restricted for Canadian Applications — See Guide BXUV7



HORIZONTAL SECTION



HORIZONTAL SECTION

1. Steel Floor and Ceiling Tracks — (Not Shown) — Top and bottom tracks of wall assemblies shall consist of steel members, min No. 20 MSG (0.0329 in., min bare metal thickness) steel or min No. 20 GSG (0.036 in. thick) galv steel or No. 20 MSG (0.033 in. thick) primed steel, that provide a sound structural connection between steel studs, and to adjacent assemblies such as a floor, ceiling, and/or other walls. Attached to floor and ceiling assemblies with steel fasteners spaced not greater than 24 in. O.C.

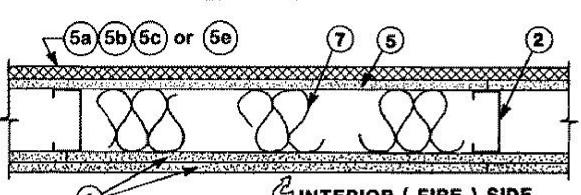
2. Steel Studs — Min 3-1/2 in. wide, No. 20 MSG (0.0329 in., min bare metal thickness) corrosion protected cold formed steel studs designed in accordance with the current edition of the Specification for the Design of Cold-Formed Steel Structural Members by the American Iron and Steel Institute. All design details enhancing the structural integrity of the wall assembly, including the axial design load of the studs, shall be as specified by the steel stud designer and/or producer, and shall meet the requirements of all applicable local code agencies. The max stud spacing of wall assemblies shall not exceed 24 in. OC (or 16 in. OC when Item 5b is used). Studs attached to floor and ceiling tracks with 1/2 in. long Type S-12 steel screws on both sides of studs or by welded or bolted connections designed in accordance with the AISI specifications.

3. Lateral Support Members — (Not shown) — Where required for lateral support of studs, support may be provided by means of steel straps, channels or other similar means as specified in the design of a particular steel stud wall system.

4. Gypsum Board* — Any 1/2 in. thick UL Classified Gypsum Board that is eligible for use in Design No. X515. Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. L501, G512 or U305. Gypsum board bearing the UL Classification Marking as to Fire Resistance. Applied vertically with joints between layers staggered. Outer layer of 3 layer construction may be applied horizontally unless specified below. The thickness and number of layers and percent of design load for the 45 min, 1 hr, 1-1/2 hr and 2 hr ratings are as follows:

Rating	Wallboard Protection Both Sides of Wall - No. of Layers & Thkns of Board In. Each Layers	% of Design Load
45 min	*1 layer, 1/2 in. thick	100
1 hr	*1 layer, 5/8 in. thick	100
1-1/2 hr	*2 layers, 1/2 in. thick	100
2 hr	*2 layers, 5/8 in. thick or	80
	*3 layers, 1/2 in. thick	100
	*2 layers, 3/4 in. thick	100

*Ratings applicable to assemblies serving as exterior walls where Classified fire resistive gypsum sheathing type wallboard is substituted on the exterior face.



HORIZONTAL SECTION

1. Steel Floor and Ceiling Tracks — (Not Shown) — Top and bottom tracks of wall assemblies shall consist of steel members, min No. 20 MSG (0.0329 in., min bare metal thickness) steel or min No. 20 GSG (0.036 in. thick) galv steel or No. 20 MSG (0.033 in. thick) primed steel, that provide a sound structural connection between steel studs, and to adjacent assemblies such as a floor, ceiling, and/or other walls. Attached to floor and ceiling assemblies with steel fasteners spaced not greater than 24

2. Steel Studs — Min 3-1/2 in. wide, No. 20 MSG (0.0329 in., min bare metal thickness) corrosion protected cold formed steel studs designed in accordance with the current edition of the Specification for the Design of Cold-Formed Steel Structural Members by the American Iron and Steel Institute. All design details enhancing the structural integrity of the wall assembly, including the axial design load of the studs, shall be as specified by the steel stud designer and/or producer, and shall meet the requirements of all applicable local code agencies. The max stud spacing of wall assemblies shall not exceed 24 in. OC (or 16 in. OC when Item 5b is used). Studs attached to floor and ceiling tracks with 1/2 in. long Type S-12 steel screws on both sides of studs or by welded or bolted connections designed in accordance with the AISI specifications.

3. Lateral Support Members — (Not shown) — Where required for lateral support of studs, support may be provided by means of steel straps, channels or other similar means as specified in the design of a particular steel stud wall system.

4. Gypsum Board* — Any 1/2 in. thick UL Classified Gypsum Board that is eligible for use in Design No. X515. Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. L501, G512 or U305. Gypsum board bearing the UL Classification Marking as to Fire Resistance. Applied vertically with joints between layers staggered. Outer layer of 3 layer construction may be applied horizontally unless specified below. The thickness and number of layers and percent of design load for the 45 min, 1 hr, 1-1/2 hr and 2 hr ratings are as follows:

Interior Walls

Rating	Wallboard Protection Both Sides of Wall - No. of Layers & Thkns of Board In. Each Layers	% of Design Load
45 min	*1 layer, 1/2 in. thick	100
1 hr	*1 layer, 5/8 in. thick	100
1-1/2 hr	*2 layers, 1/2 in. thick	100
2 hr	*2 layers, 5/8 in. thick or	80
	*3 layers, 1/2 in. thick	100
	*2 layers, 3/4 in. thick	100

*Ratings applicable to assemblies serving as exterior walls where Classified fire resistive gypsum sheathing type wallboard is substituted on the exterior face.

Exterior Walls

Rating	Wallboard Protection on Interior Side of Wall - No. of Layers & Thkns of Board In. Each Layers	% of Design Load
45 min	1 layer, 5/8 in. thick	100
1 hr	2 layers, 1/2 in. thick	100
1-1/2 hr	2 layers, 5/8 in. thick	100
2 hr	3 layers, 1/2 in. thick	100
	2 layers, 3/4 in. thick	100

ACADIA DRYWALL SUPPLIES LTD (View Classification) — CKNX.R25370

AMERICAN GYPSUM CO (View Classification) — CKNX.R14196

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO (View Classification) — CKNX.R19374

CERTAINTEED GYPSUM CANADA INC (View Classification) — CKNX.R15187

 $\textbf{CERTAINTEED GYPSUM INC} \ \underline{(\textit{View Classification})} - \textit{CKNX.R3660}$

CGC INC (View Classification) — CKNX.R19751

GEORGIA-PACIFIC GYPSUM L L C (View Classification) — CKNX.R2717

LAFARGE NORTH AMERICA INC (View Classification) — CKNX.R18482

LOADMASTER SYSTEMS INC (View Classification) — CKNX.R11809

NEW NGC INC, DBA NATIONAL GYPSUM CO (View Classification) — CKNX.R3501

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM (View Classification) — CKNX.R7094

PANEL REY S A (View Classification) — CKNX.R21796

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD (View Classification) — CKNX.R19262

TEMPLE-INLAND (View Classification) — CKNX.R6937

THAI GYPSUM PRODUCTS PCL (View Classification) — CKNX.R27517

UNITED STATES GYPSUM CO (View Classification) — CKNX.R1319

USG MEXICO S A DE C V (View Classification) — CKNX.R16089

4A. **Gypsum Board** — Nom. 3/4 in. gypsum board applied vertically with joints between layers staggered. The thickness and

number of layers and percent of design load for the 2 hr ratings are shown in the table above.

ACADIA DRYWALL SUPPLIES LTD — Type X

CGC INC — Types AR, IP-AR, IP-X3, or ULTRACODE

USG MEXICO S A DE C V — Types AR, IP-AR, IP-X3, or ULTRACODE

UNITED STATES GYPSUM CO — Types AR, IP-AR, IP-X3, or ULTRACODE

4B. Gypsum Board* — As an alternate to Item 4 - Nom. 5/8 in. thick gypsum panels, with square edges, applied horizontally. Gypsum panels fastened to framing with 1 in. long bugle head steel screws spaced a max 8 in. OC, with last 2 screws 3/4 in. and 4 in. from each edge of board. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs on interior walls need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers on interior walls (multilayer systems) staggered a min of 12 in.

TEMPLE-INLAND — GreenGlass Type X

NEW NGC INC, DBA NATIONAL GYPSUM CO - Type FSW-6.

4C. **Gypsum Board*** — (As an alternate to Items 4 and 4A) - 5/8 in. thick, 4 ft. wide, paper surfaced applied vertically only and secured as described in Item 6.

NEW NGC INC, DBA NATIONAL GYPSUM CO — SoundBreak XP Type X Gypsum Board

TEMPLE-INLAND - Type X ComfortGuard Sound Deadening Gypsum Board.

4D. Wall and Partition Facings and Accessories* — (As an alternate to Items 4 through 4B) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 4.

SERIOUS ENERGY INC — Types QuietRock ES, QuietRock 527.

5. **Gypsum Sheathing** — For exterior walls, 1/2 or 5/8 in. thick Classified or unclassified exterior gypsum sheathing applied vertically and attached to studs and runner tracks with 1 in. long Type S-12 bugle head screws spaced 12 in. OC. along studs and tracks. One of the following exterior facings are to be applied over the gypsum sheathing.

> a. **Siding, Brick, or Stucco** — Aluminum siding, steel siding, brick veneer, or stucco attached to studs over gypsum sheathing and meeting the requirements of local code agencies. When a min 3-3/4 in. thick brick veneer facing is used, the Exterior Wall Rating is applicable with exposure on either face. Brick veneer wall attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick. When a min 3-3/4 in. thick brick veneer facing is used, Foamed Plastic (Item 10) may be used.

b. Cementitious Backer Units* - 1/2 or 5/8 in. thick, square edge boards, attached to steel studs over gypsum sheathing with 1-5/8 in. long, Type S-12, corrosion resistant, wafer head steel screws, spaced 8 in. OC. Studs spaced a max of 16 in. OC. Joints covered with glass fiber mesh tape.

UNITED STATES GYPSUM CO — Type DCB

c. Fiber-Cement Siding — Fiber-cement exterior sidings including smooth and patterned panel or lap

d. Molded Plastic* — Solid vinyl siding mechanically secured to framing members in accordance with manufacturer's recommended installation details. ALSIDE, DIV OF ASSOCIATED MATERIALS INC

e. **Wood Structural Panel or Lap Siding —** APA Rated Siding, Exterior, plywood, OSB or composite panels with veneer faces and structural wood core, per PS 1 or APA Standard PRP-108, including textured, rough sawn, medium density overlay, brushed, grooved and lap siding.

f. **Building Units*** — (Not Shown) - 3 in. thick 18 x 24 in. cellular glass blocks, applied to the gypsum sheathing (Item 5) with PC 88 adhesive or fastened with F anchors spaced a maximum 24 in. OC. F anchors fastened to framing members with 1-1/4 in. long #6 drywall screws.

PITTSBURGH CORNING CORP — Type FoamGlas

6. Fasteners — (Not Shown) — Screws used to attach wallboard to studs: self-tapping bugle head sheet steel type, spaced 12 in. O.C. First layer Type S-12 by 1 in. long for 1/2 and 5/8 in. thick wallboards and 1-1/4 in. long for 3/4 in. thick wallboard. Second layer Type S-12 by 1-5/8 in. long for 1/2 and 5/8 in. thick wallboards and 2-1/4 in. long for 3/4 in. thick wallboard. Third layer Type S-12 by 1-7/8 in. long.

7. Batts and Blankets* — Placed in stud cavities of all exterior walls. May or may not be used in interior walls. Any glass fiber or mineral wool batt material bearing the UL Classification Marking as to Fire Resistance, of a thickness to completely fill stud

See **Batts and Blankets*** (BZJZ) Category for names of Classified companies.

7A. Fiber, Sprayed* — As an alternate to Batts and Blankets (Item 7) — (100% Borate Formulation) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product with a nominal dry density of 2.7 lb/ft³. Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 3.5 lb/ft³, in accordance with the application instructions supplied with the product.

U S GREENFIBER L L C — INS735 & INS745 for use with wet or dry application. INS765LD and INS770LD are to be used for dry application only.

7B. **Fiber, Sprayed*** — As an alternate to Item 7 and 7A — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. Nominal dry density of 4.58 lb/ft³.

NU-WOOL CO INC — Cellulose Insulation

7C. Fiber, Sprayed* — As an alternate to Batts and Blankets (Item 7) - Spray applied cellulose fiber. The fiber is applied with minimum dry density shall be 4.30 lbs/ft³.

INTERNATIONAL CELLULOSE CORP — Celbar-RL

OWENS CORNING SPECIALTY & FOAM PRODUCTS - WeepGuard

8. Joint Tape and Compound — (Not Shown) — Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layer. Perforated paper tape, 2 in. wide, embedded in first layer of compound over all joints of

9. Furring Channels — (Optional, not shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. 10. Foamed Plastic* — Not Shown -For use with brick veneer as outlined in Item 5A - Maximum 2 in. thick rigid polystyrene

insulation attached to studs with fasteners of sufficient length to penetrate the foam and 3/16 in. into the stud. A minimum 1 in. air space is to be maintained between the outer surface of the foamed plastic and the inner surface of the brick veneer.

OWENS CORNING SPECIALTY & FOAM PRODUCTS 10A. Mortar Drop Protection — (Optional, Not shown) - foamed plastic with mortar control device attached, continuous, by drainage holes at bottom of air space behind brick veneer.

10B. Foamed Plastic* — Polyisocyanurate foamed plastic insulation boards, any thickness, Classified in accordance with BRYX and / or CCVW. May be used with any exterior facing shown under items 5a, 5c, 5d and 5e.

THE DOW CHEMICAL CO — Type Thermax Sheathing, Thermax Light Duty Insulation, Thermax Heavy Duty Insulation, Thermax Metal Building Board, Thermax White Finish Insulation, Thermax ci Exterior Insulation, Thermax IH Insulation, Thermax Plus Liner Panel and Thermax Heavy Duty Plus (HDP)

HUNTER PANELS — Type Xci-Class A

11. Cementitious Backer Units* — (Optional Item Not Shown - For Use On Face Of 1 Hr Or 2 Hr Systems With All Standard Items Required) - 7/16 in., 1/2 in., 5/8 in., 3/4 in. or 1 in. thick, min. 32 in. wide.- Applied vertically or horizontally with vertical joints centered over studs. Fastened to studs and runners with cement board screws of adequate length to penetrate stud by a minimum of 3/8 in. for steel framing members spaced a max of 8 in. OC. When 4 ft. wide boards are used, horizontal joints need not be backed by framing. 2-Hr System - Applied vertically with vertical joints centered over studs. Face layer fastened over gypsum board to studs and runners with cement board screws of adequate length to penetrate stud by a minimum of 3/8 in. for steel framing members, and a minimum of 3/4 in. for wood framing members spaced a max of 8 in. OC.

NEW NGC INC, DBA NATIONAL GYPSUM CO — Type DuraBacker, PermaBase, DuraBacker Plus, or PermaBase Plus

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UL Fire-Resistance Ratings Designs

APPROVED BY:

MEDICAL CENTER DIRECTO **Replace Boiler Plant** Generator

> 7 & 9 GDL/STP STP VAMC - Durham 508 Fulton Street

21 June 2013 558-11-102FCA 13-E-07

Durham, North Carolina

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Joint Systems

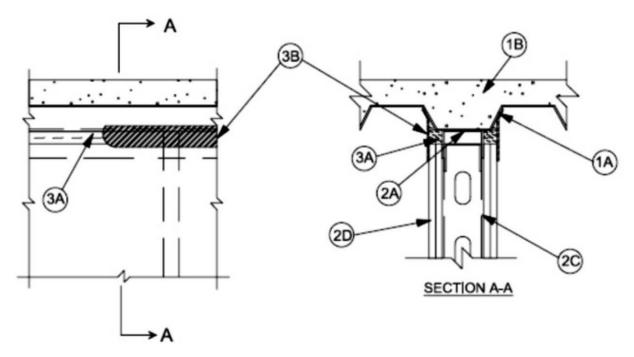
See General Information for Joint Systems

System No. HW-D-0049

January 11, 2013 Assembly Ratings — 1 and 2 Hr (See Items 2 and 3B)

Nominal Joint Width — 1 In.

Class II Movement Capabilities — 50% Compression Or Extension



1. Floor Assembly — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following

A. Steel Floor And Form Units* — Max 3 in. (76 mm) deep galv steel fluted units.

B. Concrete — Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor

C. Spray-Applied Fire Resistive Materials* — (Optional) - (Not Shown)—Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B) the steel floor

units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (44 mm) thickness of fire resistive material.

W R GRACE & CO - CONN — Type MK-6-HY

1A. **Roof Assembly** - (Not Shown) - As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. Steel Roof Deck — Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. Roof Insulation — Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane

1B. Roof Assembly — As an alternate to Items 1 and 1A, a fire rated protected fluted steel deck roof assembly may be used. The roof

assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. Steel Roof Deck — Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Spray—Applied Fire Resistive Materials*** — (Not Shown)—Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B), the roof assembly shall be sprayed with the type and thickness of fire resistive material indicated in the individual P700 Series design.

2. Wall Assembly — The 2 hr fire rated gypsum board /steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

> A. Steel Floor And Ceiling Runners — Floor and ceiling runners of wall assembly shall consist of min 25 ga galv steel channels sized to accommodate steel studs (Item 2C). Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner installed parallel to direction of fluted steel deck, centered beneath valley, and secured with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

> A1. Light Gauge Framing*-Slotted Ceiling Runner — As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2C). Slotted ceiling runner installed parallel to direction of fluted steel deck, centered beneath valley, and secured with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS — SLP-TRK

CALIFORNIA EXPANDED METAL PRODUCTS CO — CST

CLARKDIETRICH BUILDING SYSTEMS — Type SLT, SLT-H

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Type SLT

METAL-LITE INC — The System

SCAFCO STEEL STUD MANUFACTURING CO

STEELER INC — Steeler Slotted Ceiling Runner

TELLING INDUSTRIES L L C - True-Action Deflection Track

A2. Light Gauge Framing*-Vertical Deflection Ceiling Runner — As an alternate to the ceiling runners in Items 2A and 2A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent astening of steel studs. Flanges sized to accommodate steel studs (Item 2C). Vertical deflection ceiling runner installed parallel to direction of fluted steel deck, centered beneath deck, and secured with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

THE STEEL NETWORK INC — VertiTrack VTD250, VTD362, VTD400, VTD600 and VTD800

A3. Light Gauge Framing —Floor and Ceiling Runners — As an alternate to the ceiling and floor runners in Item 2A, 2A1, 2A2 and 2A3, floor and ceiling runners to consist of galv steel channel sized to accommodate the Light Gauge Framing* Slotted Stud (Item 2C1) or Light Gauge Framing* Slider C-Clip System (Item 2C2). Floor and ceiling runners to be provided with min 1-1/4 in. (32 mm) and 3 in. (76 mm) flanges, respectively. Ceiling runner installed parallel to direction of fluted steel deck, centered beneath deck, and secured with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC, before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

STEELER INC — Floor and Ceiling Runners

A4. Light Gauge Framing*- Notched Ceiling Runner — As an alternate to the ceiling runners in Items 2A through 2A4, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2C). Notched ceiling runner installed parallel to direction of fluted steel deck, centered beneath valley, and secured with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

OLMAR SUPPLY INC — Type SCR

B. Steel Attachment Clips — (Optional - Not Shown) - When spray applied fireproofing is used ceiling runner may be secured to deck with Z-shaped clips formed from min 1 in. (25 mm) long strips of min 20 ga galv steel. Length of clips should not exceed the width (thickness) of the wall. Clips to be sized to extend through the thickness of the spray-applied fire-resistive material on the bottom of the steel deck with 1-1/2 or 2 in. (38 or 51 mm) long upper and lower legs. Legs of clips fastened perpendicular to valleys of steel deck (prior to application of spray-applied fire-resistive materials) and top of ceiling runner with steel fasteners or welds. Clips

C. Studs - Steel studs to be min 2-1/2 in. (64 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. Stud spacing not to exceed 24 in. (610 mm) OC. When vertical deflection ceiling runner (Item 2A2) is used, steel studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. (610 mm) OC.

C1. Light Gauge Framing* -Slotted Studs - Slotted steel stud to be used in conjunction with Light Gauge Framing* -Floor and Ceiling Runners (Item 2A4). Slotted steel studs to be min 2-1/2 in. (64 mm) wide. Slotted steel studs cut $\mathtt{1}$ in. less in length than assembly height with bottom nesting in and secured to both ceiling and floor runners. Ceiling runner secured to preformed slot within steel stud by means of No. 10 by 3/4 n. (19 mm) long low profile head steel screw. Floor runner attached to bottom of steel stud by means of No. 8 by 1/2 in. (13 mm) long pan head steel screw. Slotted steel stud spacing not to exceed 24 in. (610 mm) OC.

STEELER INC — Slotted Stud

C2. Light Gauge Framing* - Slider C-Clip System - As an alternate to the Light Gauge Framing* -Slotted Steel Studs (Item 2C1), a Slider C-Clip System consisting of a C shaped steel clip with a slotted opening and a steel stud to be used in conjunction with Light Gauge Framing —Floor and Ceiling Runners (Item 2A4). Steel clips and studs to be min 2-1/2 in. (64 mm) wide. Steel clip inserted into inside flange of steel stud without attachment. Total length of steel stud cut 1 in. (25 mm) less than assembly height with bottom of steel stud nesting in and secured to floor runner. Floor runner attached to bottom of steel stud by means of No. 8 by 1/2 in. (13 mm) long pan head steel screw. Ceiling runner secured to steel C-Clip by means of No. 10 by 3/4 in. (19 mm) long pan head steel screw located 3/8 in. (10 mm) below top of ceiling runner. Top row of gypsum board screws shall be centered within the preformed slot of the C-Clip. Steel stud and steel clips spacing not to exceed 24 in. (610 mm) OC.

STEELER INC — Slider C Clip System

D. **Gypsum Board*** — Gypsum board installed to a min total thickness of 5/8 in. (16 mm) and 1-1/4 in. (32 mm) on each side of wall for 1 and 2 Hr rated assemblies respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom of the steel floor units and the top row of screws shall be installed into the studs 3-1/2 (89 mm) to 4 in. (102 mm) below the lower surface of the floor. The hourly rating of the joint system is equal to the hourly fire rating of the wall.

3. Joint System — Max separation between bottom of floor and top of wall at time of installation of joint system is 1 in. (25 mm). The joint system is designed to accommodate a max 50 percent compression or extension from its installed width. The joint system consists of forming material and a fill material, as follows:

> A. Forming Material* — Nom 5/8 in. (16 mm) and 1-1/4 in. (32 mm) wide strips of min 4 pcf (64 kg/m³) mineral wool batt insulation for 1 and 2 hr rated assemblies respectively, cut to thickness, compressed 50 percent in thickness and firmly packed into the gap between the top of the gypsum board and bottom of the steel floor units on both sides of the wall. Adjoining lengths of strips to be tightly butted with butted seams spaced min 48 in. (1.2 m) apart along the length of the joint.

ROCK WOOL MANUFACTURING CO — Delta- Board

ROXUL INC — SAFE

THERMAFIBER INC — Type SAF

A1. Forming Material* - Strips — (Optional) - Nom 5/8 in. (16 mm) and 1-1/4 in. (32 mm) wide precut mineral wool strips for 1 and 2 hr rated assemblies respectively. The strips are compressed 50 percent in thickness and firmly packed into the gap between the top of the gypsum board and bottom of the steel floor units on both sides of the wall. Adjoining lengths of strips to be tightly butted with butted seams spaced min 48 in. (1.2 m) apart along the length of the joint.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 767 Speed Strips

B. Fill, Void or Cavity Material* — Min 1/16 in. (1.6 mm) dry thickness (min 1/8 in. or 3.2 mm wet thickness) of fill material sprayed or troweled on each side of the wall to completely cover mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto gypsum board and steel deck on both sides of wall. When spray-applied fire resistive material is applied to the steel floor and form units, the fill material is to overlap the gypsum board a min of 1/2 in. (13 mm) and the spray-applied fire resistive material a min of 2 in. (51 mm) on ooth sides of wall. When spray-applied fire resistive materials are used, the CP672 firestop spray shall overlap the wall a min 1/2 in. (13 mm) and overlap the spray-applied fire resistive material a min of 2 in. (51 mm) on

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP672 Firestop Spray or CFS-SP WB Firestop

*Bearing the UL Classification Mark

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System No. HW-D-0042 **Joint Systems**

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- the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction. Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

XHBN - Joint Systems

XHBN7 - Joint Systems Certified for Canada

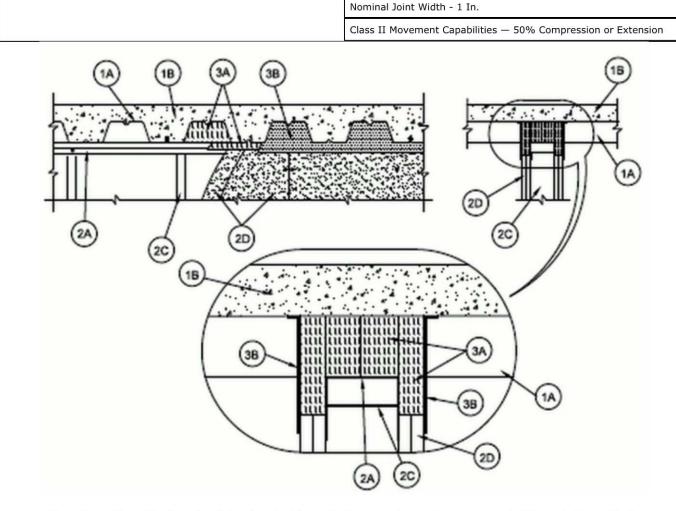
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See General Information for Joint Systems Certified for Canada

System No. HW-D-0042

January 11, 2013

ANSI/UL2079 CAN/ULC S115 embly Ratings — 1 and 2 Hr (See Items 2 and 3A) Ratings — 1 and 2 Hr (See Items 2 and 3A) ominal Joint Width - 1 In. T Ratings -1 and 2 Hr (See Items 2 and 3A) class II Movement Capabilities — 50% Compression or Extension FH Ratings — 1 and 2 Hr (See Items 2 and 3A) FTH Ratings — 1 and 2 Hr (See Items 2 and 3A)



1. Floor Assembly — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 or D900 Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following

A. Steel Floor And Form Units* — Max 3 in. (76 mm) deep galv steel fluted units.

B. **Concrete** — Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor

C. Spray-Applied Fire Resistive Materials* — (Optional, Not Shown)—Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B, respectively) the steel floor units may be sprayed with a min 5/16 in. (8 mm) to max 1-3/4 in. (45 mm) thickness of fire resistive

W R GRACE & CO - CONN — Type MK-6-HY

1A. Roof Assembly — (Not Shown) — As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. Steel Roof Deck — Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Roof Insulation** — Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane

1B. Roof Assembly — As an alternate to Items 1 and 1A, a fire rated protected fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof assembly shall include the following construction features:

A. Steel Roof Deck — Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. Spray—Applied Fire Resistive Materials* — (Not Shown)—Prior to or after the installation of the steel ceiling runners, Forming Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B), the roof assembly shall be sprayed with the type and thickness of fire resistive material indicated in the individual P700 Series design.

2. Wall Assembly — The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include

> A. Steel Floor And Ceiling Runners — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2C). Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

> A1. Light Gauge Framing*-Slotted Ceiling Runner — As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2C). Slotted ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC before optional spray-applied fire resistive material is used. Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS — SLP-TRK

CALIFORNIA EXPANDED METAL PRODUCTS CO — CST

CLARKDIETRICH BUILDING SYSTEMS — Type SLT, SLT-H

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — SDT250, SDT300

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Type SLT

METAL-LITE INC — The System

OLMAR SUPPLY INC — STT250, STT300

SCAFCO STEEL STUD MANUFACTURING CO

TELLING INDUSTRIES L L C — True-Action Deflection Track

A2. Light Gauge Framing*-Vertical Deflection Ceiling Runner — When the nom joint width is less than or equal to 3/4 in. (19 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runners in Items 2A and 2A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with step bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2C). Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional

THE STEEL NETWORK INC — VertiTrack VTD250, VTD362, VTD400, VTD600 and VTD800

A3. Light Gauge Framing*- Notched Ceiling Runner — As an alternate to the ceiling runners in Items 2A through 2A3, notched ceiling runners to consist of C-shaped galy steel channel with notched return flanges sized to accommodate steel studs (Item 2C). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

OLMAR SUPPLY INC — Type SCR

B. Steel Attachment Clips — (Optional - Not Shown) - When spray applied fireproofing is used ceiling runner

may be secured to deck with Z-shaped clips formed from min 1 in. (25 mm) long strips of min 20 ga galv steel. Length of clips should not exceed the width (thickness) of the wall. Clips to be sized to extend through the thickness of the spray-applied fire-resistive material on the bottom of the steel deck with 1-1/2 or 2 in. (38 or 51 mm) long upper and lower legs. Legs of clips fastened to valleys of steel deck (prior to application of sprayapplied fire-resistive materials) and top of ceiling runner with steel masonry anchors, steel fasteners or welds. Clips spaced max 24 in. (610 mm) OC.

C. Studs — Steel studs to be min 2-1/2 in. (64 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A2) is used, steel studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. (610

D. **Gypsum Board*** — Gypsum board installed to a min total thickness of 5/8 in. and 1-1/4 in. (16 and 32 mm) on each side of wall for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a max 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom of the steel deck units and the top row of screws shall be installed into the studs 3-1/2 to 4 in. (89 to 102 mm) below the lower surface of the floor or roof. The hourly rating of the joint system is dependent on the hourly rating of the wall.

3. Joint System — Max separation between bottom of floor or roof and top of wall at time of installation of joint system is 1 in. (13 mm). The joint system is designed to accommodate a max 50 percent compression or extension from its installed width. The joint system consists of forming material and a fill material, as follows:

> A. Forming Material* — Nom 4 pcf (64 kg/m3) density mineral wool batt insulation cut approx 25 percent wider than the flutes and with a length approx equal to the overall thickness of the wall. Multiple pieces stacked on top of each other, as needed, and then compressed 50 percent in thickness and inserted into the flutes of the steel deck above the top of the ceiling runner. The mineral wool batt insulation is to project beyond each side of the ceiling runner, flush with wall surfaces. Additional 5/8 in. and 1-1/4 in. (16 and 32 mm) wide strips for 1 and 2 hr rated assemblies, respectively, of nom 4 pcf (64 kg/m³) mineral wool batt insulation are to be cut to fill the gap between the top of the gypsum board and bottom of the steel deck. The strips of mineral wool are compressed 50 percent and tightly packed, cut edge first, into the gap between the top of the gypsum board and bottom of the steel deck on both sides of the wall.

ROCK WOOL MANUFACTURING CO — Delta- Board

ROXUL INC — SAFE

THERMAFIBER INC — Type SAF

A1. Forming Material*—Plugs — (Optional, Not Shown) Preformed mineral wool plugs, formed to the shape of the fluted floor units, friction fit to completely fill the flutes above the ceiling channel. The plugs shall project beyond each side of the ceiling runner, flush with wall surfaces. Additional forming material, described in Item 3A, to be used in conjunction with the plugs to fill the gap between the top of gypsum board and bottom of

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP777 Speed Plugs

A2. Forming Material* - Strips — (Optional) - Nom 5/8 in. and 1-1/4 in. (16 and 32 mm) wide by 2 in. (51 mm) high precut mineral wool strips for 1 and 2 hr rated assemblies respectively. The strips are compressed 50 percent and firmly packed, cut edge first, into the gap between the top of the gypsum board and bottom of the steel floor units on both sides of the wall

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 767 Speed Strips

B. Fill. Void or Cavity Material* — Min 1/16 in. (1.6 mm) dry thickness (1/8 in. or 3.2 mm wet thickness) of fill material sprayed or troweled on each side of the wall to completely cover mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto gypsum board and steel deck on both sides of wall. When Spray-Applied Fire Resistive Material* is applied to the Steel Floor and Form Units*, the fill material is to overlap the gypsum board a min of 1/2 in. (13 mm) and the Spray-Applied Fire Resistive Material a min of 2 in. (51 mm) on both sides of wall. When spray-applied fire resistive materials are used, the CP 672 firestop spray shall overlap the wall a min 1/2 in. (13 mm) and overlap the spray-applied fire resistive material a min of 2 in. (51 mm) on

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HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 672 Firestop Spray or CFS-SP WB Firestop

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System No. WW-D-0040 **XHBN.WW-D-0040** Joint Systems

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- noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction. Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

XHBN - Joint Systems

XHBN7 - Joint Systems Certified for Canada

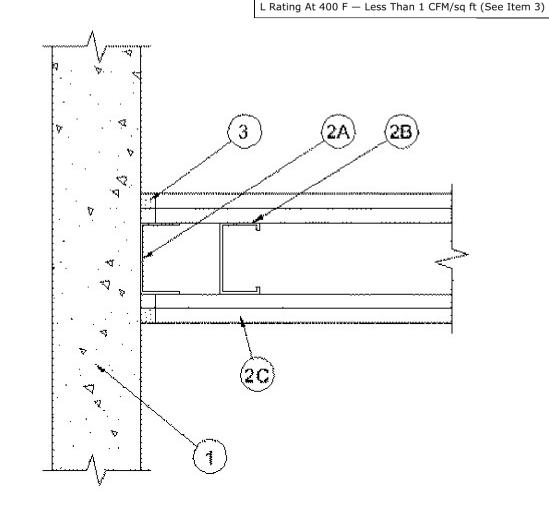
See General Information for Joint Systems Certified for Canada

See General Information for Joint Systems

System No. WW-D-0040

December 07, 2011

ANSI/UL2079	CAN/ULC S115
Assembly Ratings $-$ 1 and 2 Hr (See Item 2)	F Ratings $-$ 1 and 2 Hr (See Item 2)
Nominal Joint Width - 3/4 In.	FT Ratings $-$ 1 and 2 Hr (See Item 2)
Class II Movement Capabilities $-$ 17% Compression or Extension	FH Ratings $-$ 1 and 2 Hr (See Item 2)
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)	FTH Ratings $-$ 1 and 2 Hr (See Item 2)
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)	Nominal Joint Width - 3/4 In.
	Class II Movement Capabilities $-$ 17% Compression or Extensi
	L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)



1. Concrete Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) structural concrete. Wall may also be constructed of any UL Classified Concrete Blocks*.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers. 2. Gypsum Wall Assembly — The 1 or 2 h fire rated gypsum board/steel stud wall assembly shall be constructed of the

materials and in the manner specified in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire

A. Steel Runners — Runners of wall assembly shall consist of min No. 25 gauge galv steel channels sized to accommodate steel studs (Item 2B). Runner to be provided with 1-1/4 in. (32 mm) flanges. Runner secured to concrete wall assembly with steel concrete fasteners spaced 12 in. (305 mm) OC B. Studs — Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting

C. **Gypsum Board*** — For 1 hr assembly, one layer of 5/8 in. (16 mm) thick gypsum board is required in the individual Wall and Partition Design. For 2 hr assembly, two layers of 5/8 in. (16 mm) thick gypsum board are required in the individual Wall and Partition Design. Wall to be constructed as specified in the individual U400, V400 or W400 Series Design in the UL Fire Resistance Directory, except that a max 3/4 in. (19 mm) gap shall be maintained between the side of gypsum board and face of concrete wall assembly. The screws attaching the gypsum board to the first stud shall be located 4 in. (102 mm) from face of concrete wall assembly. Gypsum board not attached to side runner.

in ceiling runner without attachment. First stud adjacent to concrete wall assembly located max 4 in.

The hourly fire rating of the joint system is equal to the hourly rating of the gypsum wall assembly.

(102 mm) from wall face. Stud spacing not to exceed 24 in. (610 mm) OC.

4. Forming Material — (Optional, Not Shown) - Mineral wool insulation, fiberglass batt insulation or

wall assembly is 3/4 in. (19 mm). The joint system is designed to accommodate a max 17 percent compression or extension from its installed width. Min 5/8 in. (16 mm) thickness of fill material installed on each side of the wall between the side of the gypsum board and the face of the concrete wall assembly, flush with each surface of the gypsum wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S Elastomeric Firestop Sealant or CP606 Flexible Firestop

3. Fill, Void or Cavity Material* - Sealant — Max separation between side of gypsum board and face of concrete

polyurethane/polyethylene foam backer rod. Forming material to be recessed from both surfaces of the 2 hr fire rated wall to accommodate the required thickness of fill material.

Sealant. L Ratings apply only when CP606 Sealant is used.

Resistance Directory and shall include the following construction features:

Last Updated on 2011-12-07

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Replace Boiler Plant Generator

7 & 9 | GDL/STP | STP

VAMC - Durham

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XHEZ.W-L-1176 **Through-penetration Firestop Systems**

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- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with
- applicable requirements. The published information cannot always address every construction nuance encountered in the field. • When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.

Through-penetration Firestop Systems

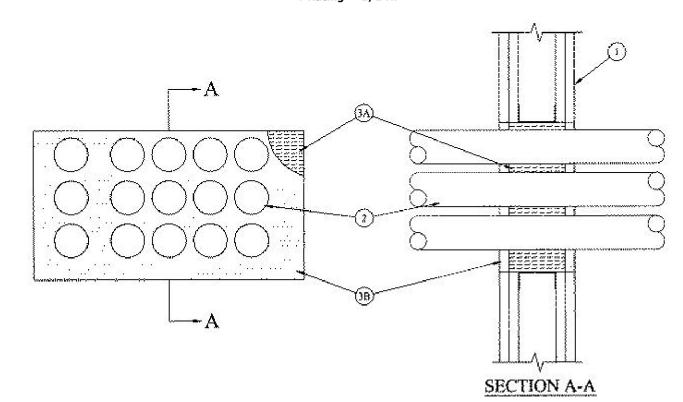
See General Information for Through-penetration Firestop Systems

System No. W-L-1176

July 08, 2003

F Ratings — 1 and 2 Hr (See Items 1 and 3A)

T Rating — 1/2 Hr



1. Wall Assembly — The 1 or 2 hr fire rated wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.

> A. **Studs** — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max

orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max area of opening is 180 sq. in. with max dimension of 18 in. Max width of openings in wood stud walls is limited 14-1/2 in.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrant** — One or more steel electrical metallic tubing to be installed within the opening. The space between tubing shall be min 1/2 in. and max 5/8 in. Tubing may be installed at an angle not greater than 45 degrees from perpendicular. Tubing to be rigidly supported on both sides of wall assembly. The space between tubing and periphery of opening shall be min 1/2 in. to max 2-3/8 in. The following types and sizes of metallic tube may be used:

A. Conduit — Nom 2 in. diam (or smaller) steel electrical metallic tubing or 2 in. diam steel conduit.

3. **Firestop System** — The firestop system shall consist of the following:

A. Packing Material — Min 2-1/2 or 3-3/4 in. thickness of min 4 pcf mineral wool batt insulation, firmly packed into the opening as a permanent form for 1 or 2 hr rated walls, respectively. Mineral wool to be recessed from both sides of the assembly to accommodate the required thickness of fill material

B. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. thickness of fill material applied within the annulus, flush with both surfaces of wall.

HILTI INC — FS-ONE Sealant

*Bearing the UL Classification Mark

Last Updated on 2003-07-08

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additional information regarding this product's certification. The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under

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System No. W-L-1297 XHEZ.W-L-1297 **Through-penetration Firestop Systems**

Page Bottom

Design/System/Construction/Assembly Usage Disclaimer

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- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction. • Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems

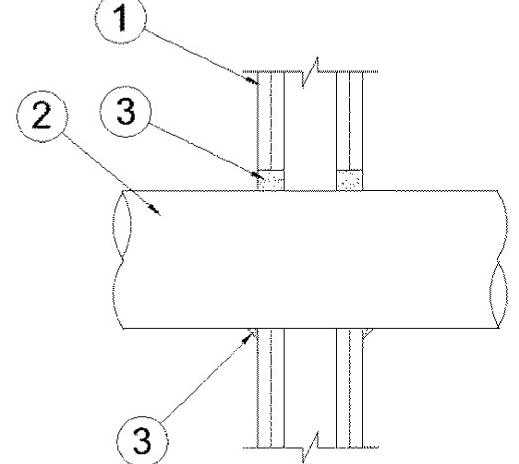
System No. W-L-1297

June 03, 2005

F Ratings — 1 and 2 Hr (See Item 1) T Rating — 0 Hr

L Rating at Ambient — Less than 1 CFM/Sq Ft

L Rating at 400° F — Less than 1 CFM/Sq Ft



1. Wall Assembly — The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.

> A. **Studs** — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.

> B. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (1.22 m) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the Fire Resistance Directory. Max diam

of opening is 32 in. (813 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrant** — One metallic pipe, conduit or tubing installed concentrically or eccentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. Pipe, conduit or tube to be rigidly supported on both sides of wall assembly. The annular space between the pipe, conduit or tube and periphery of the opening shall be min 0 in (0 mm, point contact) to max 2 in. (51 mm) in 2 hr fire rated walls and min 0 in (0 mm, point contact) to max 1 in. (25 mm) in 1 hr fire rated walls. The following types and sizes of metallic pipes, conduit or tube may be

A. Steel Pipe — Nom 30 in. (762 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.

B. Iron Pipe — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.

C. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or 6 in. diam

D. Copper Tube — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tube.

E. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. Fill, Void or Cavity Material*-Sealant — Min 5/8 in. (16 mm) or 1-1/4 in. (32 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall, for 1 hr and 2 hr fire rated wall assemblies, respectively. A min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/wall interface at the point contact location.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP606 Flexible Firestop Sealant

*Bearing the UL Classification Mark

Last Updated on 2005-06-03

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ONLINE CERTIFICATIONS DIRECTORY

System No. W-L-5047 XHEZ.W-L-5047 **Through-penetration Firestop Systems**

Page Bottom

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- Authorities Having Jurisdiction should be consulted before construction. • Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with

• Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

applicable requirements. The published information cannot always address every construction nuance encountered in the field. • When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.

Through-penetration Firestop Systems

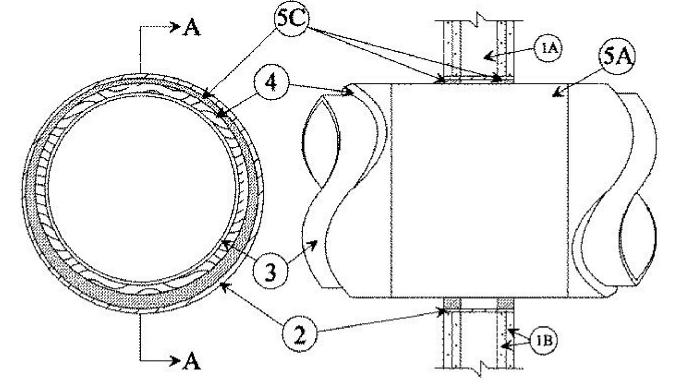
See General Information for Through-penetration Firestop Systems

System No. W-L-5047

February 08, 2006

F Ratings — 1 & 2 Hr (See Item 1)

T Rating — 0 & 1-1/2 Hr (See Item 1)



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

> A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consi of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. When steel studs are used and the diam of opening exceeds the width of the stud cavity, the opening shall be framed on all sides using lengths of studs installed between the vertical studs and attached to the studs at each end. The framed opening in the wall shall be 4 to 6 in. wider and 4 to 6 in. higher than the diam of the metallic sleeve (Item 2) such that a clearance of 2 to 3 in. is present between the sleeve and the framing on all four sides.

B. **Gypsum Board*** — Two layers of nom 5/8 in. thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 14-1/2 in. for wood stud walls and 30 in. for steel stud

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. The T Rating is 0 hr when installed in 1 hr wall assembly or when optional metallic sleeve (Item 2) is used. The T Rating is 1-1/2 hr when installed in 2

hr wall assembly and optional sleeve is not used.

2. Metallic Sleeve (Optional) - Nom 30 in. diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and installed flush with wall surfaces.

3. **Through Penetrants** — One metallic pipe or tubing to be positioned within the firestop system. Pipe or tubing to be rigidly

supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used: A. Steel Pipe — Nom 20 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. Iron Pipe — Nom 20 in. diam (or smaller) cast or ductile iron pipe.

C. **Copper Tubing** — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.

D. Copper Pipe — Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe. 4. Pipe Covering* — 1 to 3 in. thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside

with an all service jacket. Longitudinal joints sealed with metal fasteners of factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. Pipe covering to terminate 6 in. from each side

5. **Firestop System** — The firestop system shall consist of the following:

A. Pipe Covering Materials* — Nom 1 to 3 in. thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube and extending 6 in. beyond each surface of the wall surface. Pipe insulation secured with min 18 AWG steel wire 3 in. beyond each surface of the wall assembly. When steel sleeve is not used, the annular space shall be min 1/4 in. to max 3 in., or when sleeve is used, min 1 in. to

IIG MINWOOL L L C — High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation Thermaloc

B. Sheathing Material* — All service jacket material shall be wrapped around the outer circumference of the pipe covering material (Item 4A) with kraft side exposed. Longitudinal joints sealed with metal fasteners or self-sealing lap tape.

See Sheathing Material (BVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

C. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. or 1-1/4 in. thickness of fill material applied within the annulus flush with both surfaces of wall, for 1 or 2 hr walls, respectively. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant

*Bearing the UL Classification Mark

Last Updated on 2006-02-08

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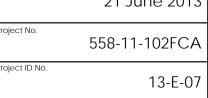
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> 7 & 9 GDL/STP STP VAMC - Durham 508 Fulton Street



Sheet of



ergency Management **UL Through-Penetration** Firestop Systems

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Construction

DESCRIPTION

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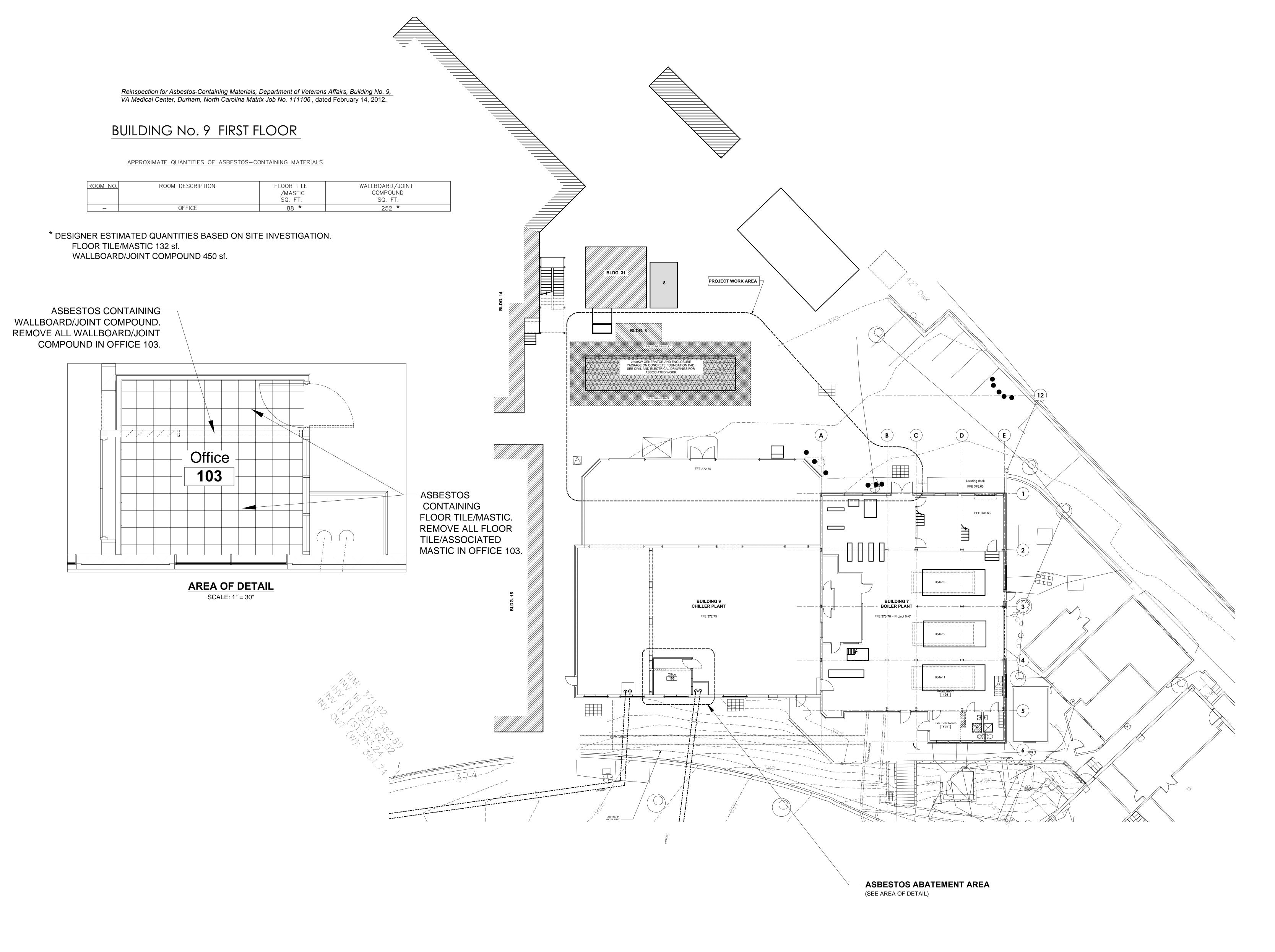
Documents

APPROVED BY: MEDICAL CENTER DIRECTO

Replace Boiler Plant Generator

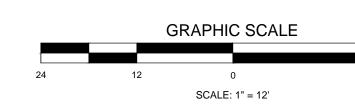
Durham, North Carolina 21 June 2013 558-11-102FCA

DRAWING NO. G006



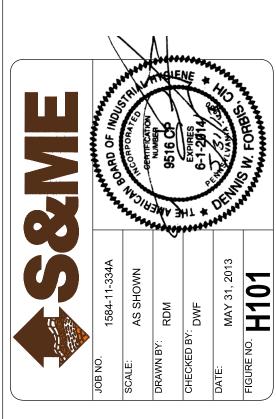
Areas of known asbestos containing materials in renovation scope per the Reinspection for Asbestos-Containing Materials, Building No. 9, Department of Veterans Affairs, VA Medical Center, Durham, North Carolina Matrix Job No. 111106, dated February 14, 2012 prepared by Matrix Health & Safety Consultants, L.L.C. (Matrix) of Raleigh, North Carolina, and provided by the VA Medical Center to RND Architects, PA and S&ME, Inc. for use with this project.

Coordinate the schedule, phasing and asbestos abatement operations with the contractor secured by the Veterans Administration to perform the overall Replace Boiler Plant Generator project. Observed all limitations with respect to access to VA facilities, placement and location of regulated areas, hours of operation and temporary storage and transport of asbestos waste with the VA representative. Remove all asbestos-containing floor tile/associated mastic and wallboard/joint compound indicated in the abatement area.



ROUGHTON • NICKELSON • DE LUCA
Architects, PA

3608 University Drive, Suite 204
Durham, NC 27707



Construction Documents

 DESCRIPTION	DAT

RECOMMEND APPRO	V۵
Requestor:	Date
Chief of Service:	Date

Infection Control:	Date:
Chief of Staff:	Date:
Assoc. Med. Ctr. Dir.:	Date:

Asbestos Abatement Plan

APPRO\	/ED BY:		Date:
MEDICAL	CENTER	DIRECTOR	

Replace Boiler Plant Generator Building No. Designed by: Drawn by: Check

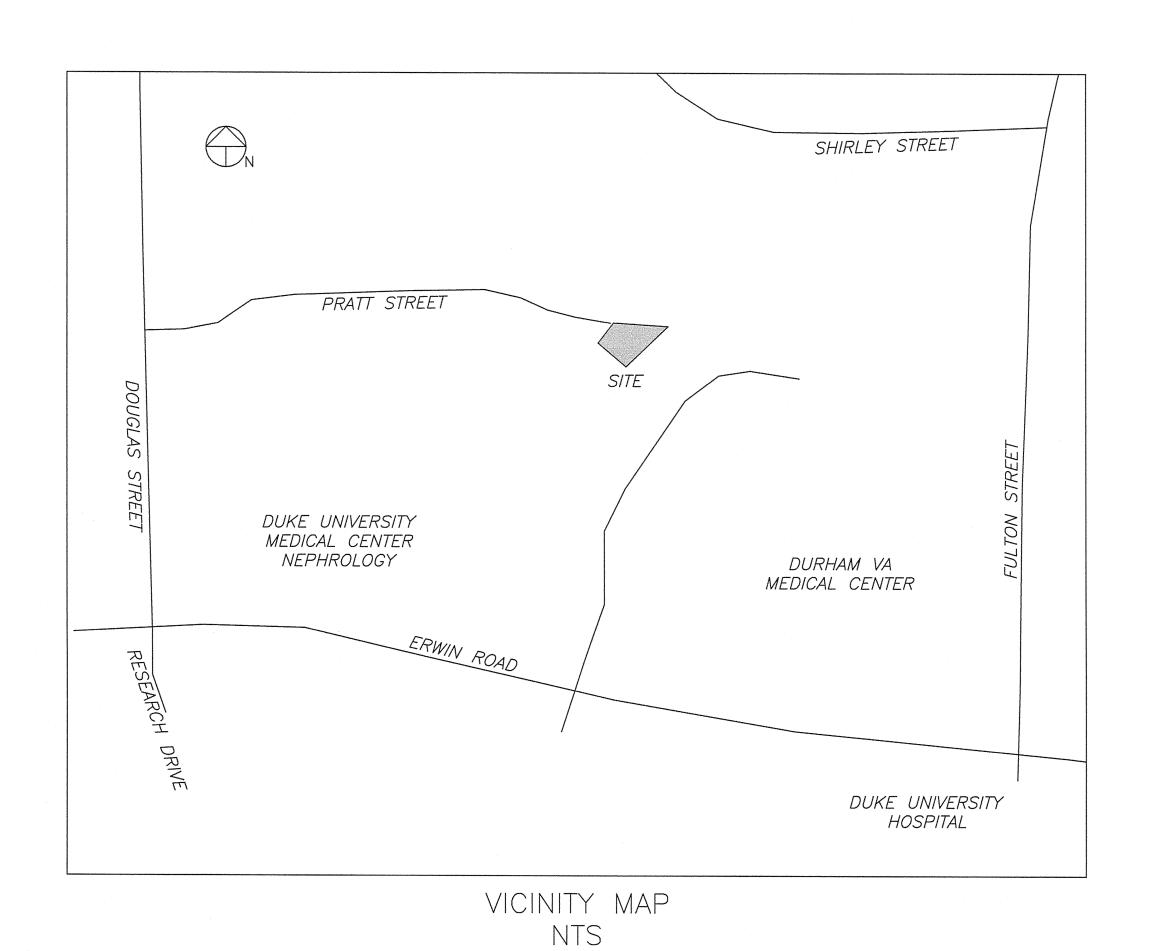
7 & 9 DWF RDM DWF Location VAMC - Durham

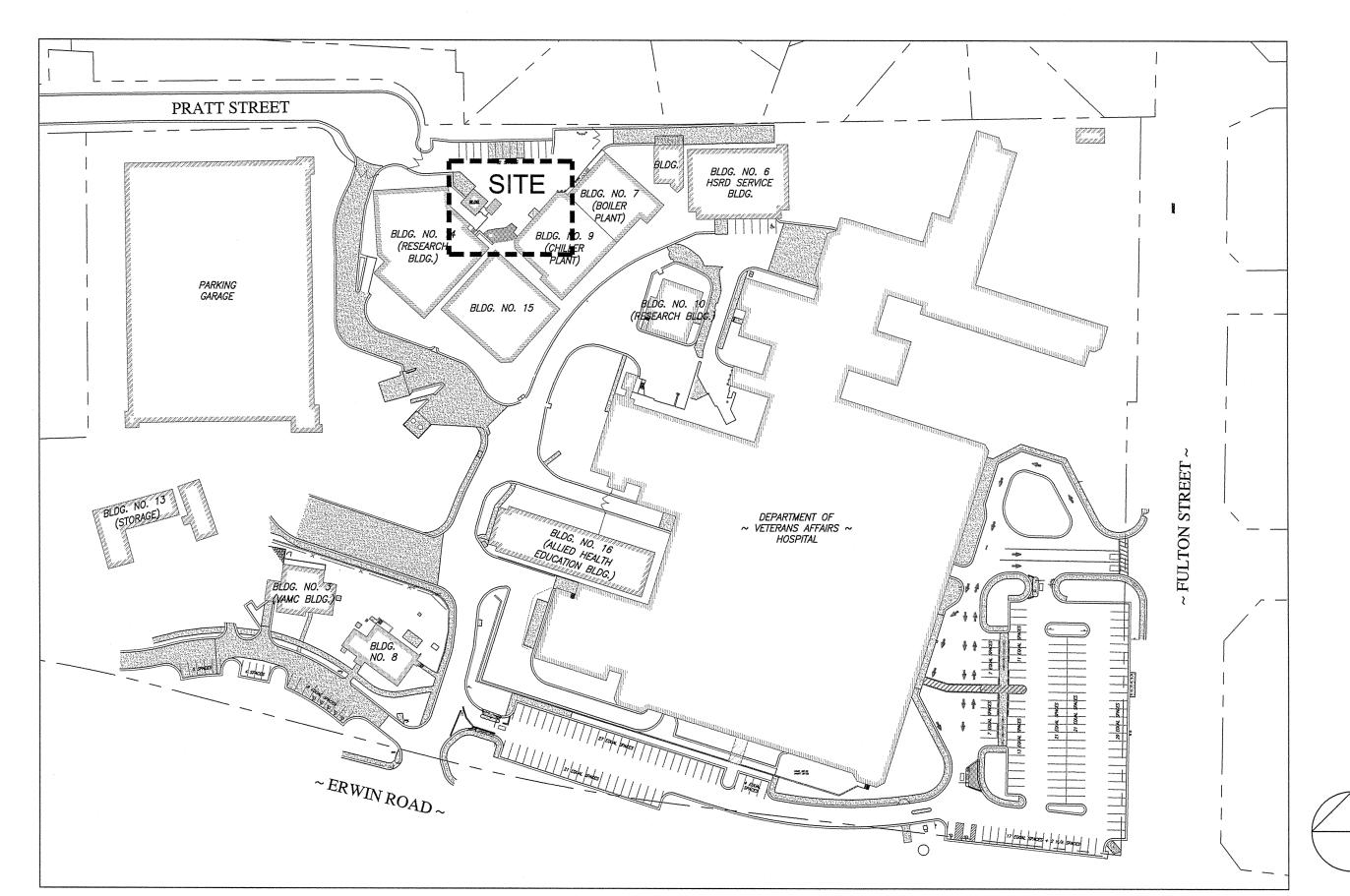
508 Fulton Street

Durham,	North Carolina
Date	05-31-2013
Project No.	558-11-102FCA
Project ID No.	13-E-07
DRAWING	NO.

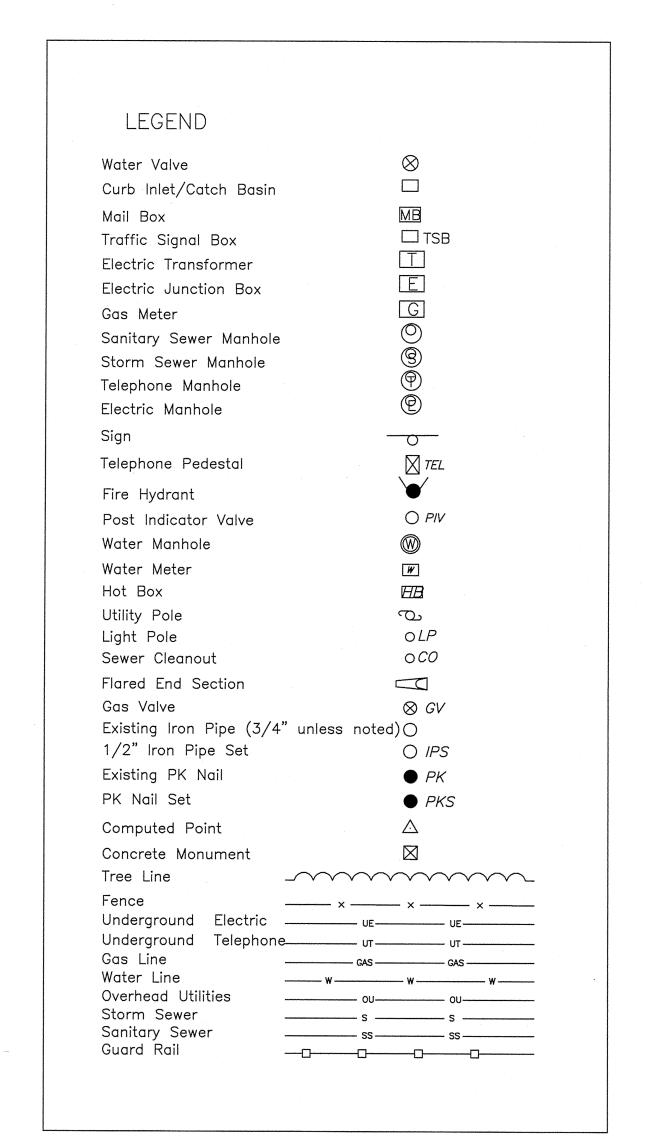
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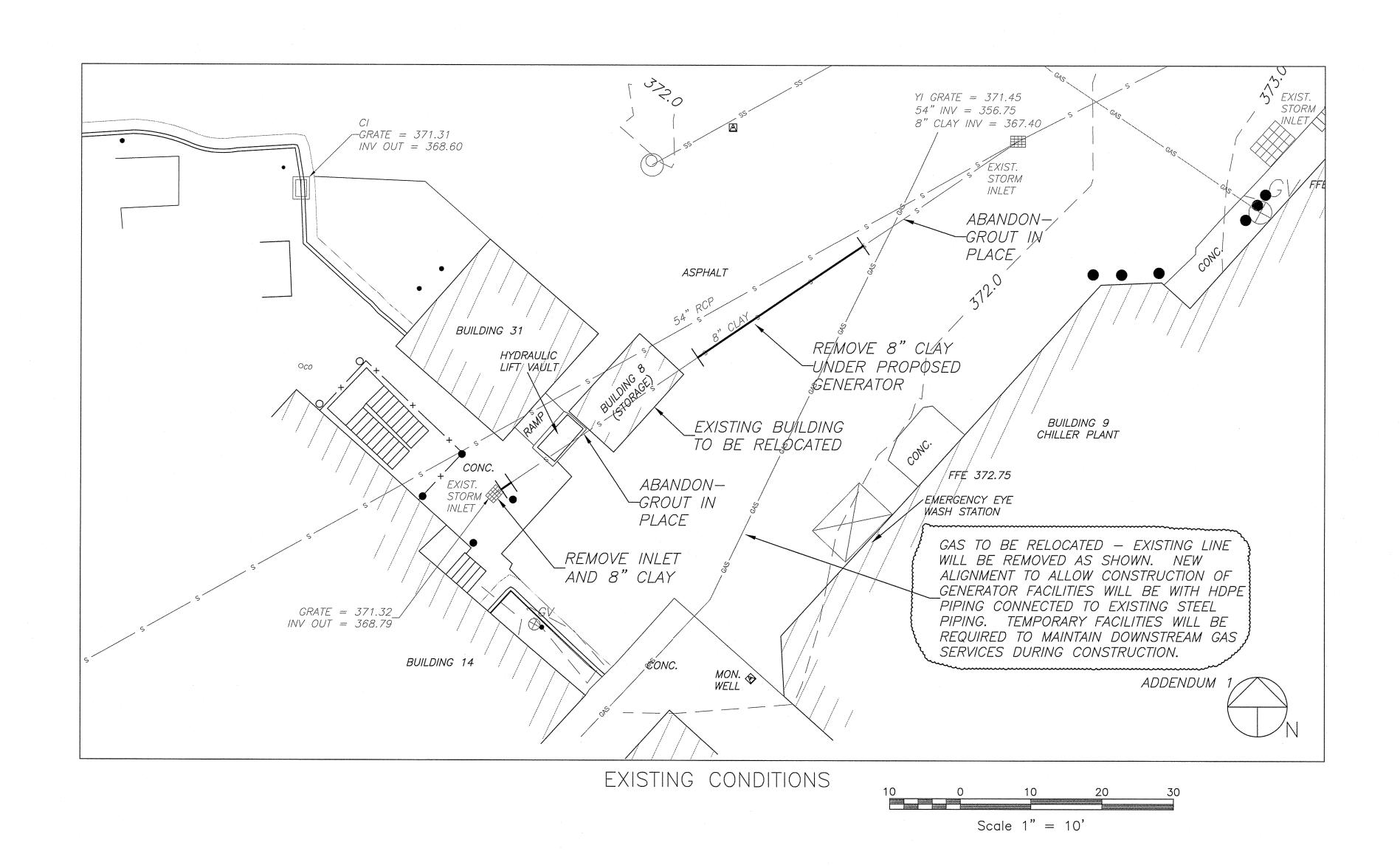
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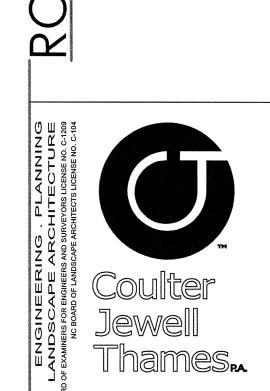








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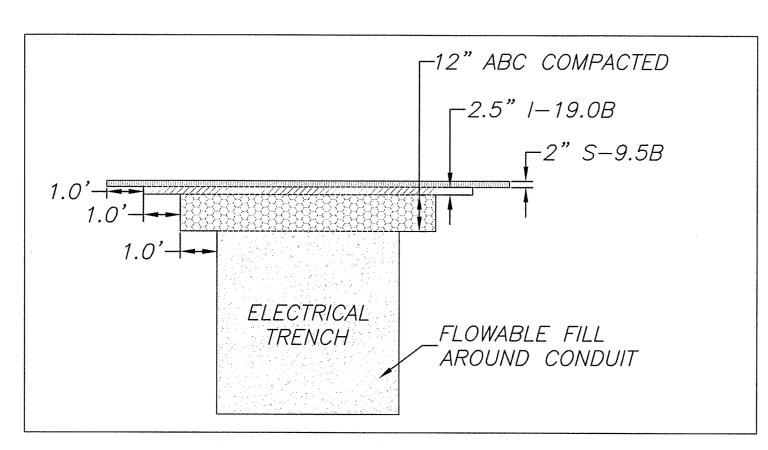


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1	ADDENDUM 1	7-15-13
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Chief of		Dafe:
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Drawing	EXISTING COND AND DEMOLITIC	
Approve	d Chief, Engineering Svc.	Date:
APF	PROVED BY:	Date:
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	REPLACE BOILER PLANT GENERATO	R
Building	No. Designed by: Drawn by:	Checked by:
7, 9		
Location	VAMC - DURHAM 508 FULTON ST.	

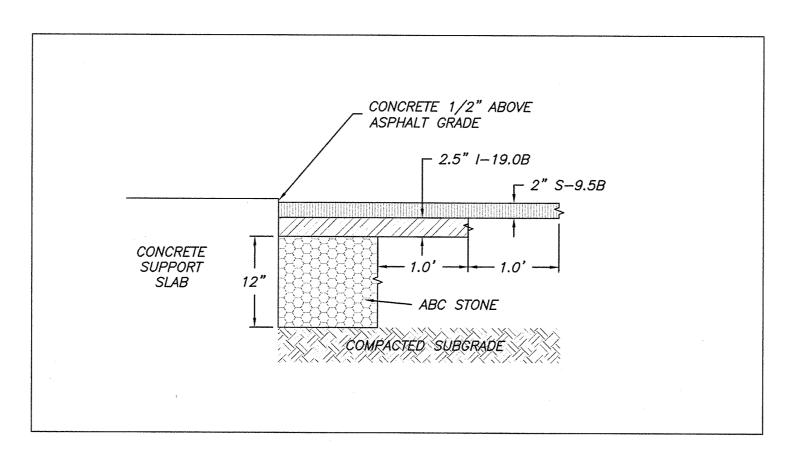
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13-E-07

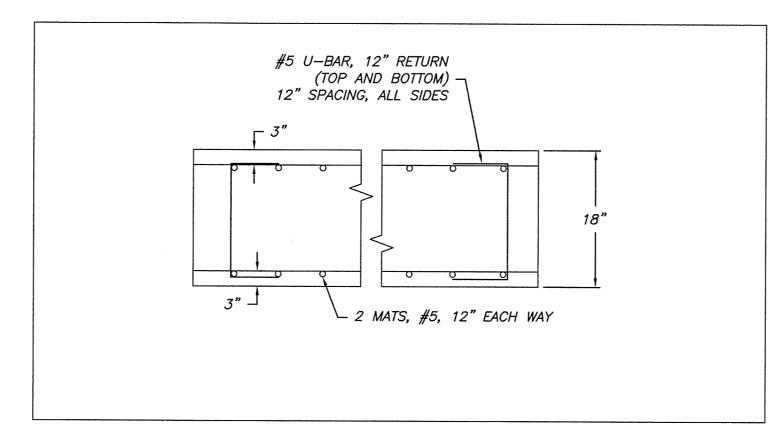
558-11-102FCA



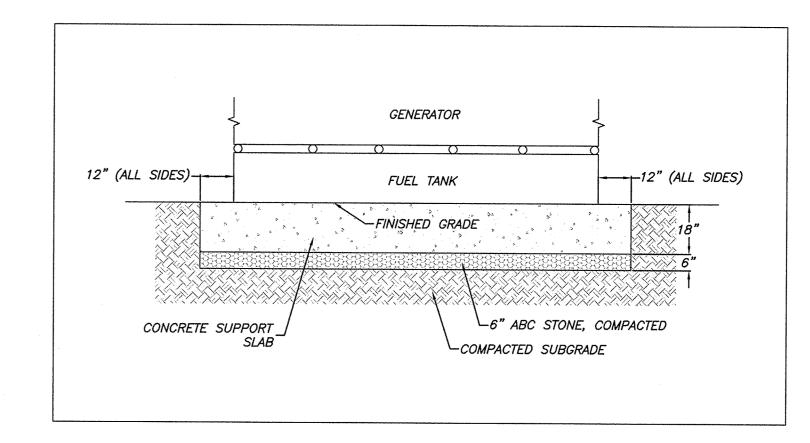




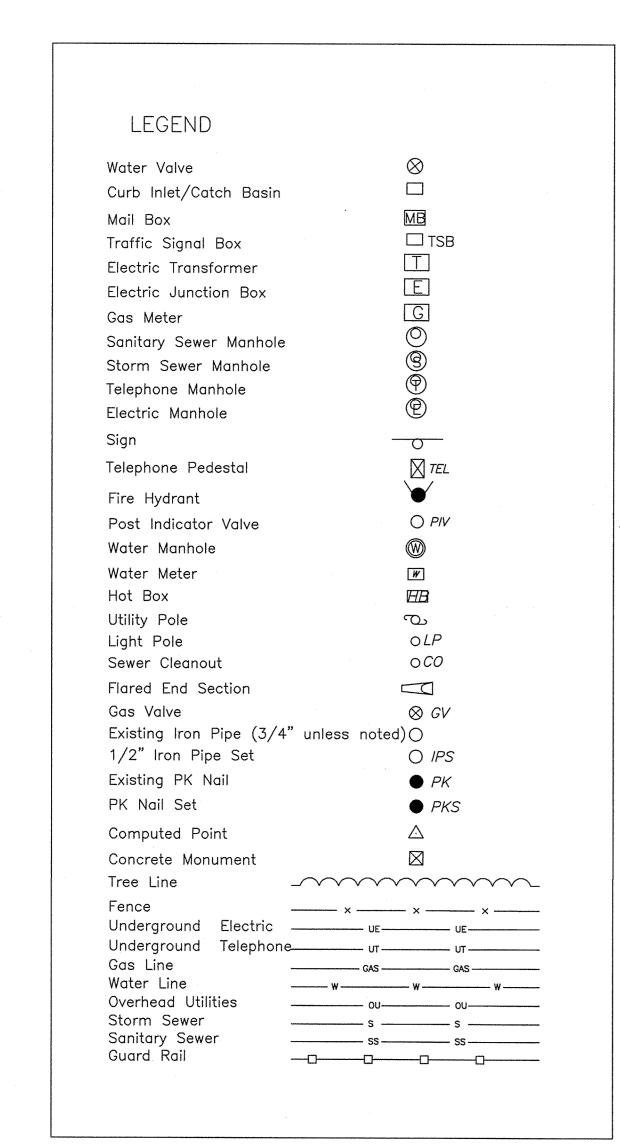
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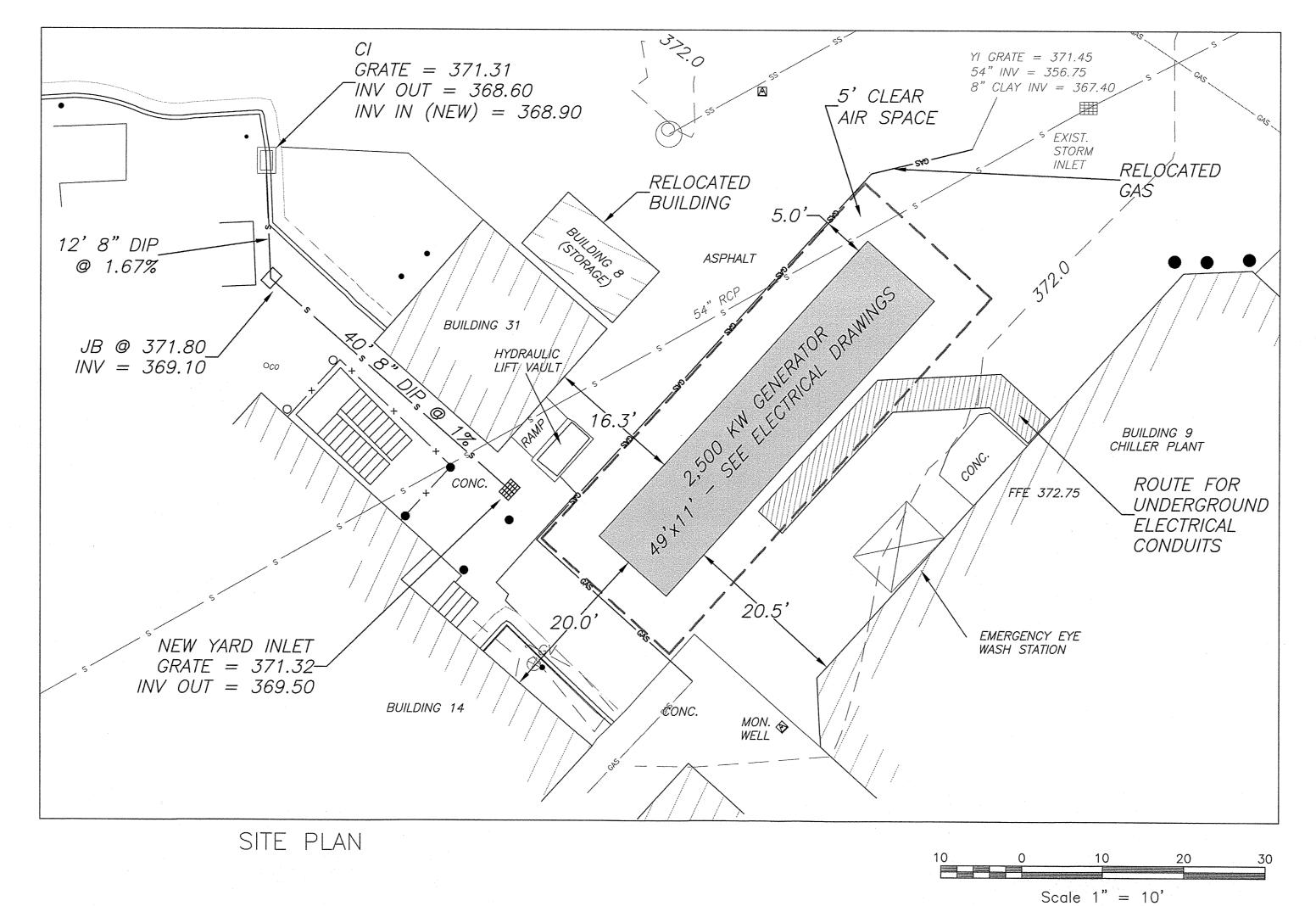


STEEL REINFORCEMENT FOR - NTS CONCRETE SUPPORT SLAB



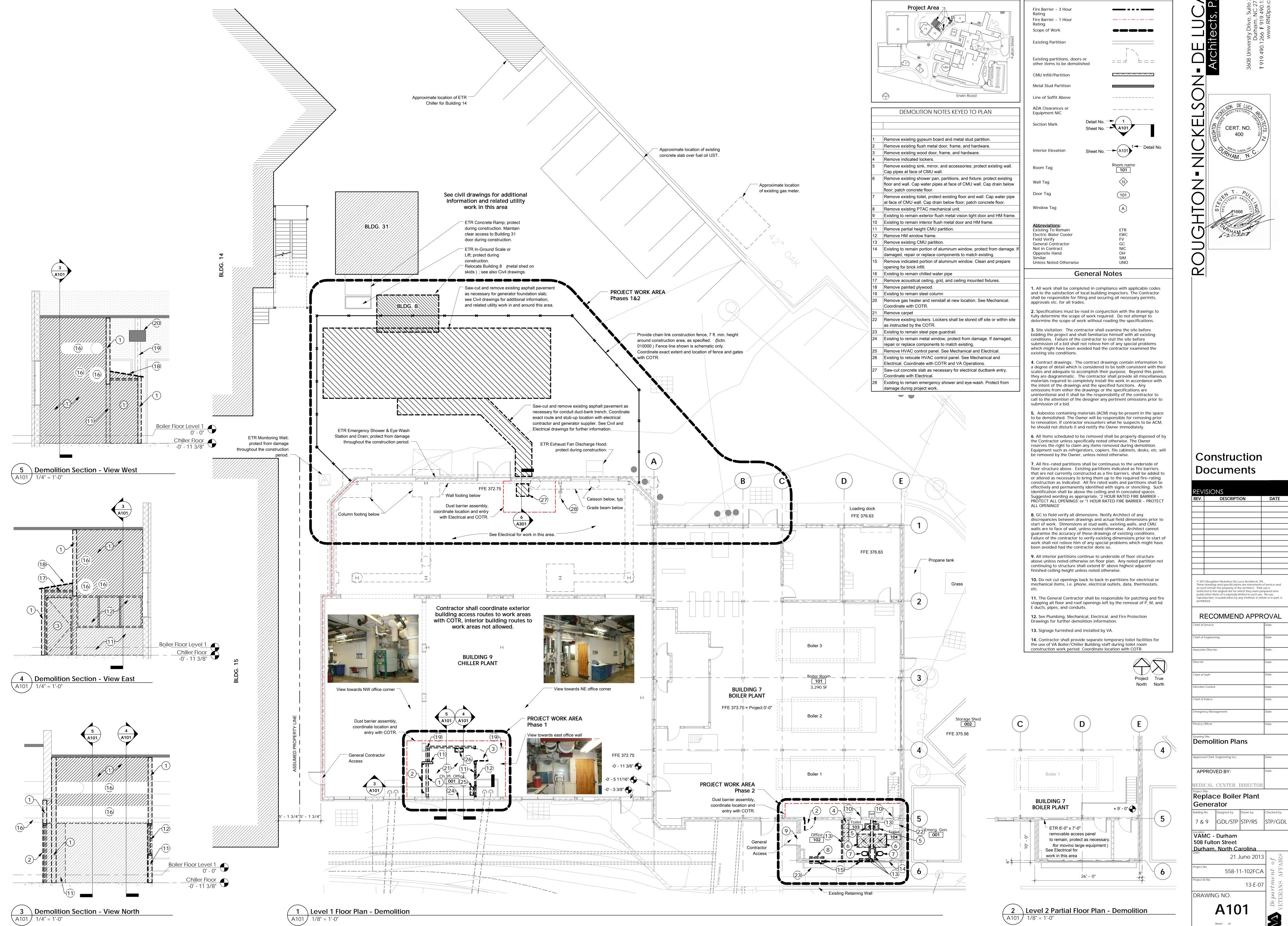
CONCRETE SUPPORT SLAB — NTS FOR GENERATOR







LANDSCAPE ARCHITECTURE IN BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS LICENSE NO. C-1209 IN BOARD OF LANDSCAPE ARCHITECT LICENSE NO. C-1209 IN BOARD OF LANDSCAPE ARCHITECTS LICENSE NO. C-1209 IN BOARD OF LANDSCAPE ARCHITECT	Architects, PA Architects, PA Architects, PA See 197 See 197	T 919.490.1266 F 919.490.1396 T 919.490.1266 F 919.490.1396 T 919.490.1266 F 919.490.1396 Www.RNDpa.com p 919.682.0368 f 919.688.5646
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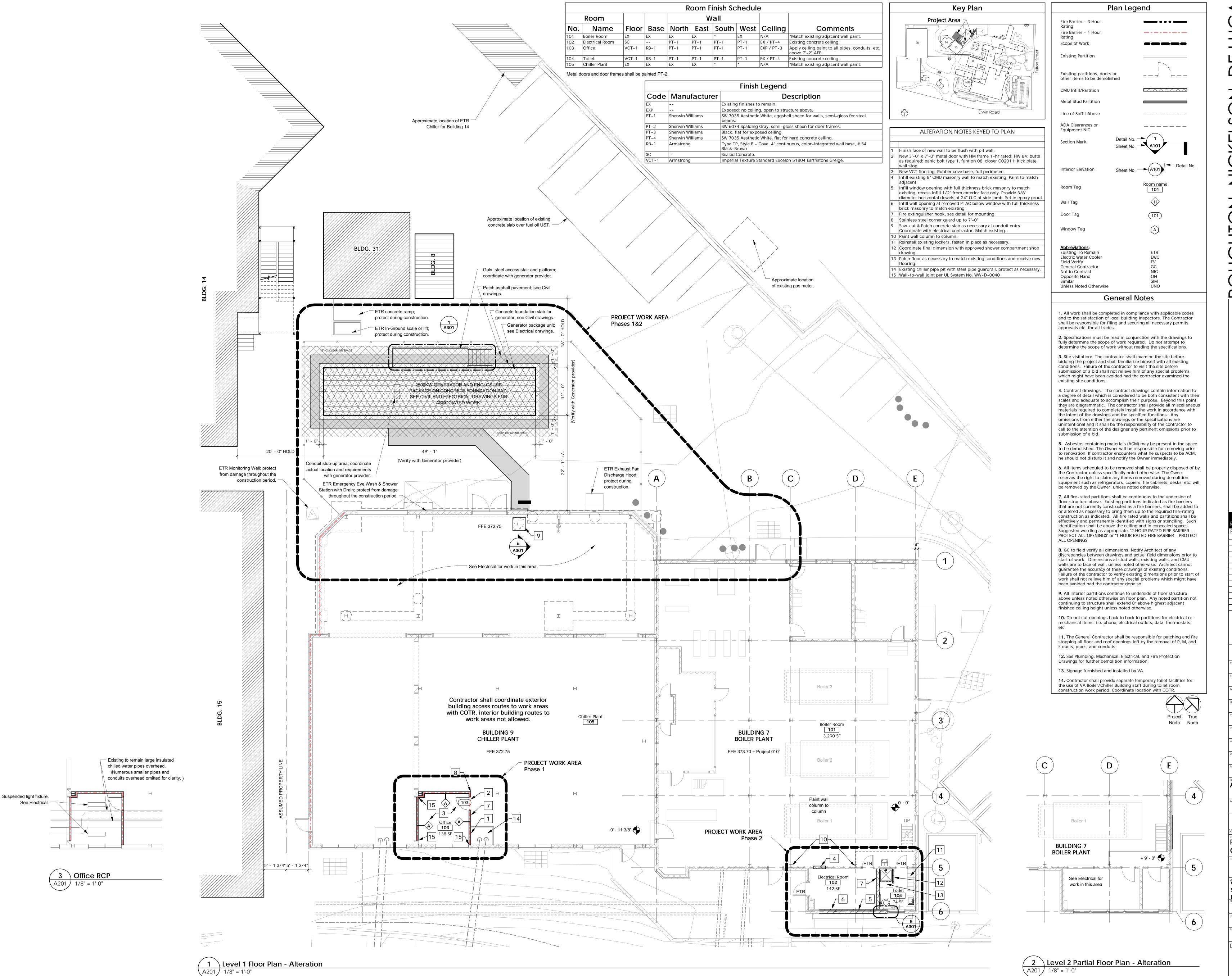


Plan Legend

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Alteration Plans

APPROVED BY:

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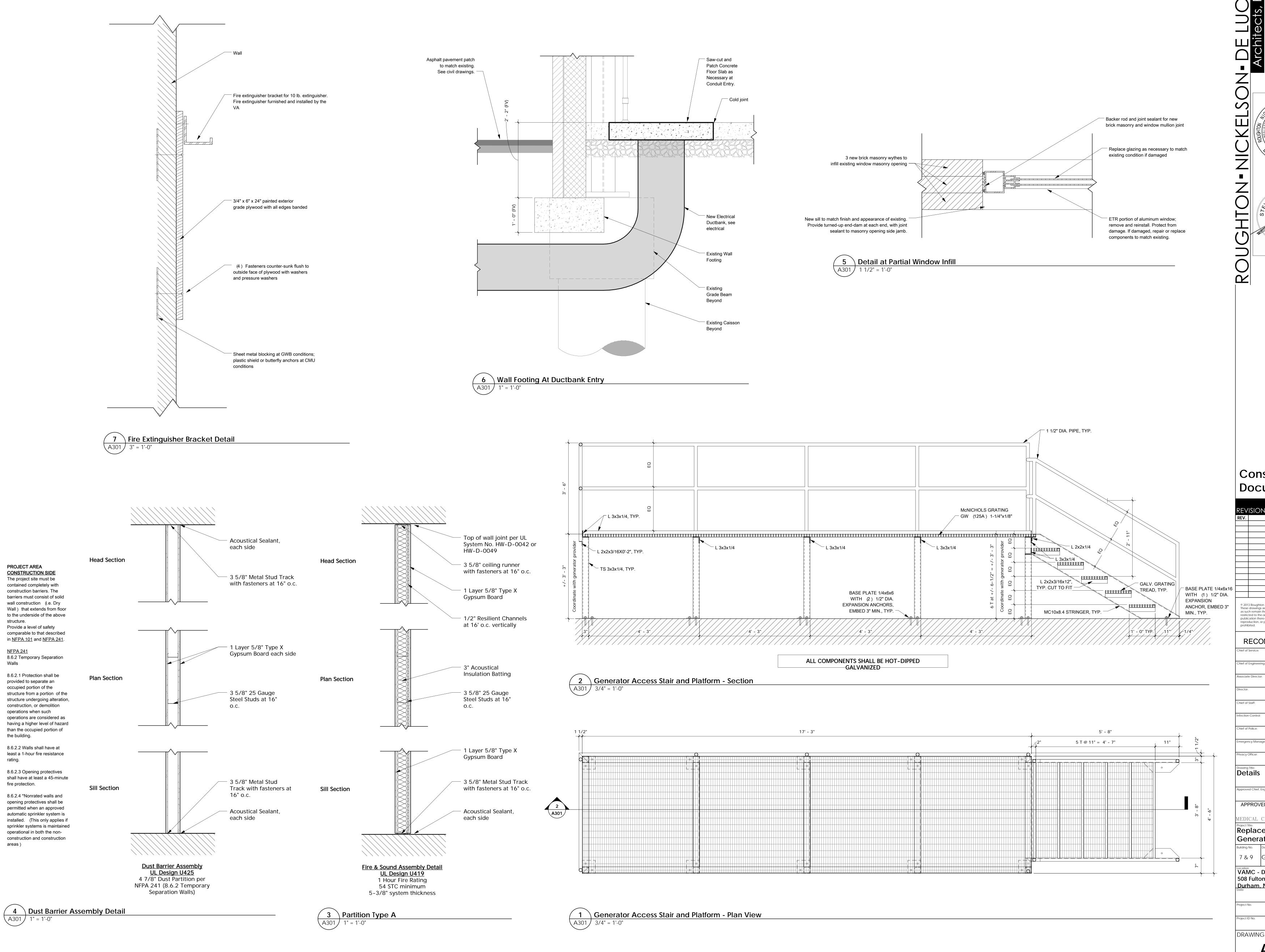
Replace Boiler Plant Generator

7 & 9 |GDL/STP|STP/RS |STP/GDL| VAMC - Durham 508 Fulton Street

21 June 2013 558-11-102FCA 13-E-07

DRAWING NO.

A201 Sheet of



Construction Documents

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MEDICAL CENTER DIRECTO

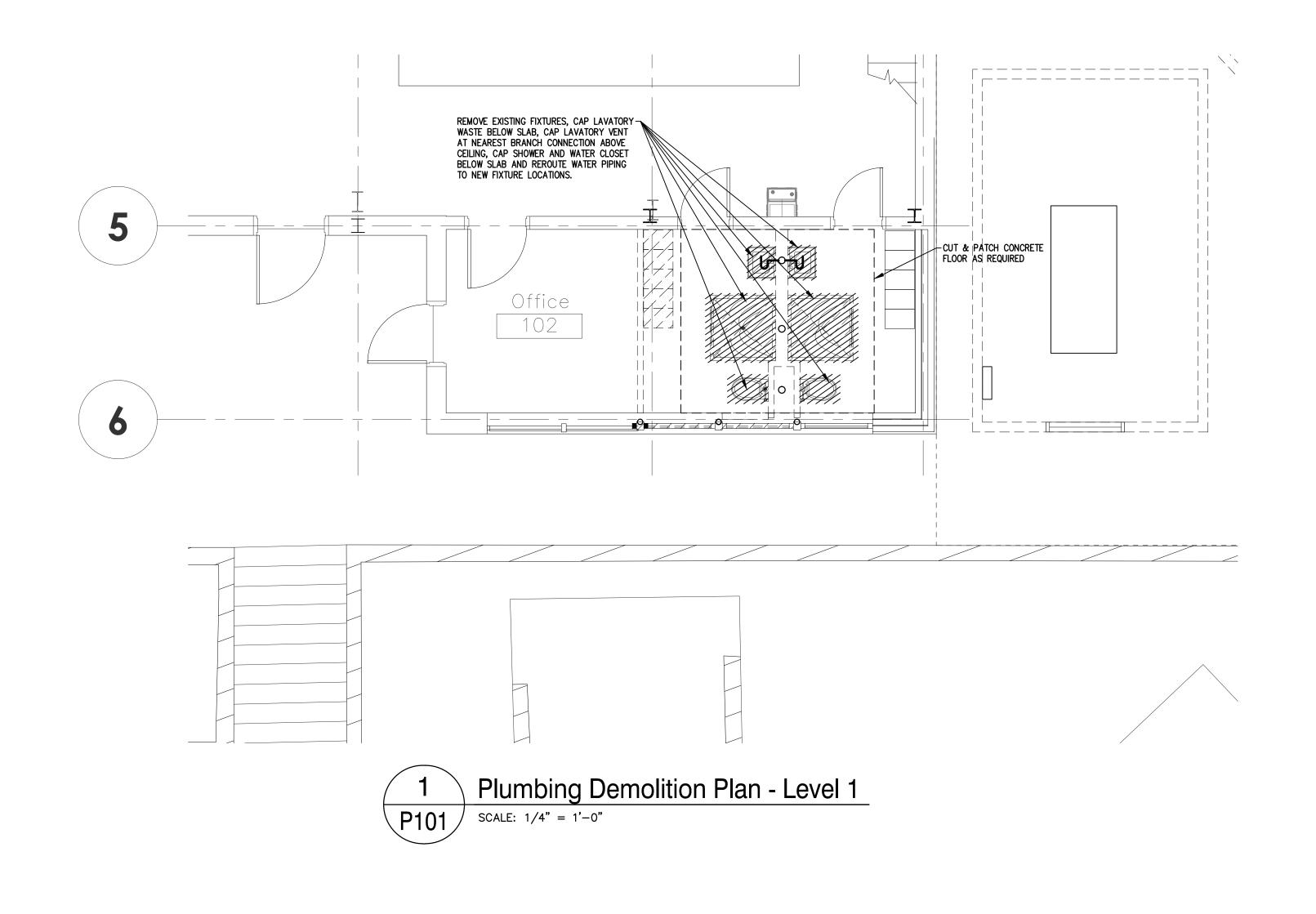
Replace Boiler Plant Generator

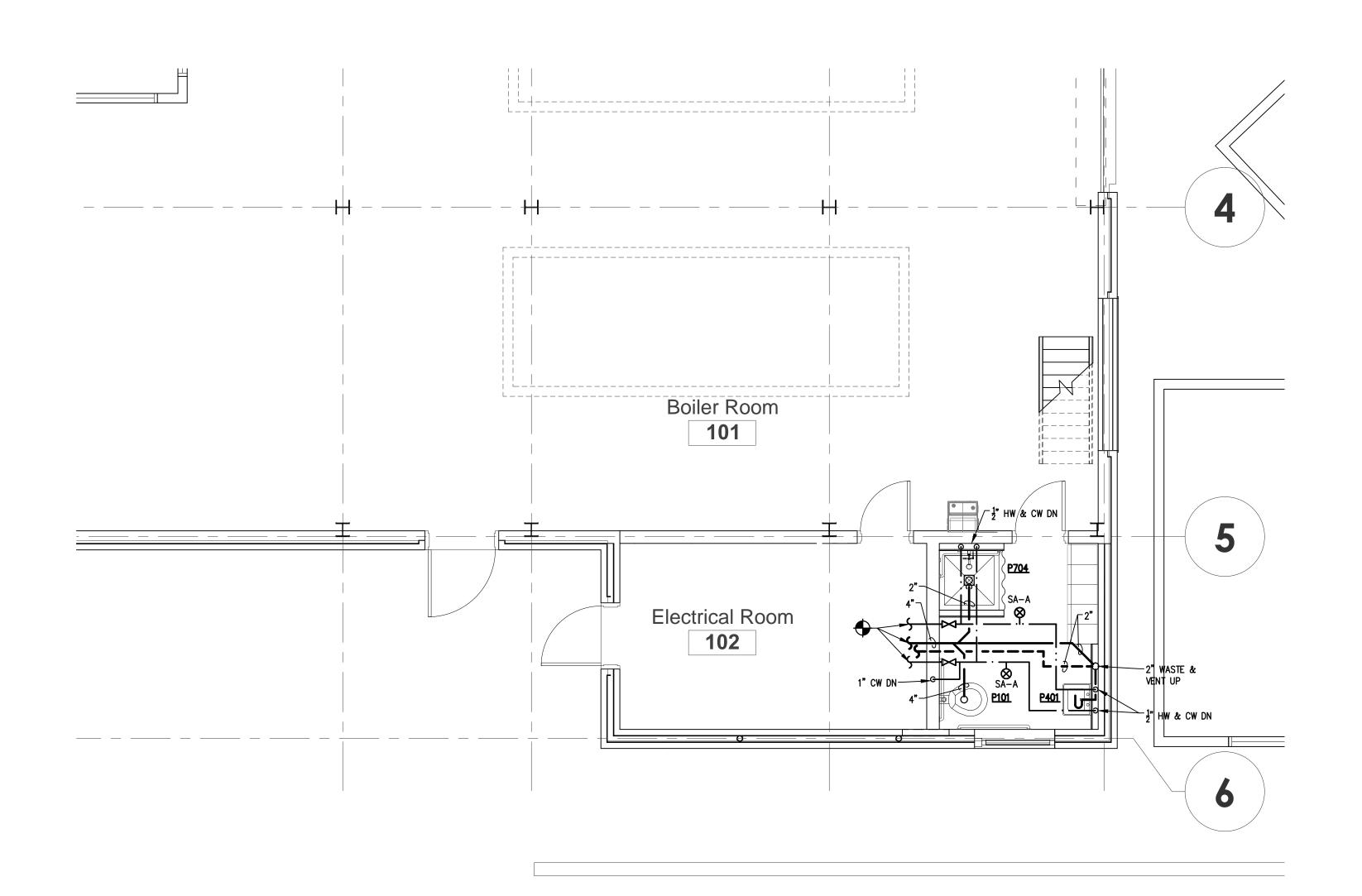
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VAMC - Durham 508 Fulton Street Durham, North Carolina

Sheet of

21 June 2013 558-11-102FCA 13-E-07 DRAWING NO. A301





Plumbing Renovation Plan - Level 1

SCALE: 1/4" = 1'-0"

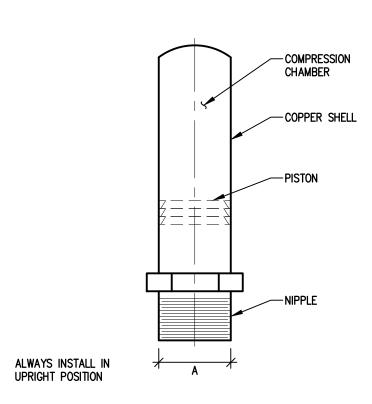
PLUM	IBING LEGEND
W	WASTE
٧	VENT
HW	HOT WATER
CW	COLD WATER
<u>P-</u>	PLUMBING FIXTURE
	SANITARY SEWER PIPING
	VENT PIPING
	COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RECIRCULATING PIPING
o	ELBOW UP
с —	ELBOW DOWN
—₩—	SERVICE VALVE
SA ⊗	SHOCK ARRESTOR
\Phi	CONNECT TO EXISTING

Key Plan
Project Area—
26 14 15 10 D 23 C C C C C C C C C C C C C C C C C C

	FIX	TURE	SCH	EDUL	.E
SYMBOL	FIXTURE	WASTE	CW	HW	REMARKS
P101	WATER CLOSET	4"	1"	-	FLOOR MOUNTED ADA
P401	LAVATORY	1-1/2"	1/2"	1/2"	WALL HUNG
P704	SHOWER	2"	1/2"	1/2"	

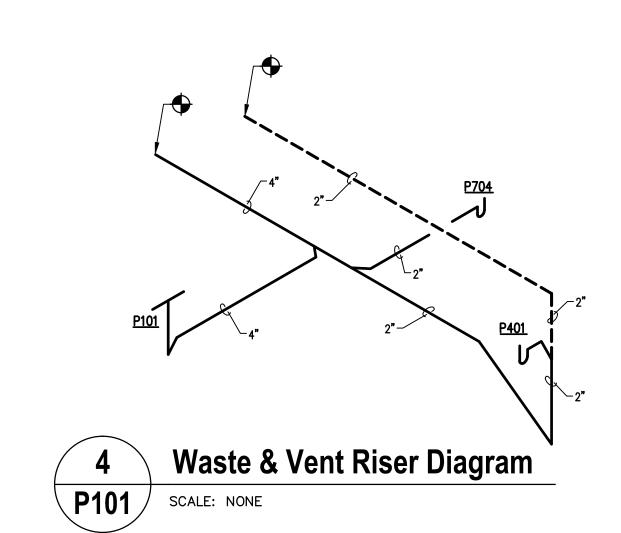
GENERAL PLUMBING DEMOLITION NOTES:

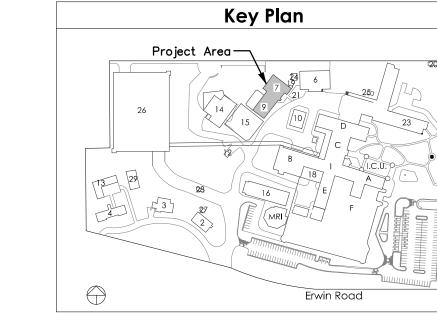
- 1. NO EXISTING PIPING SHALL BE LEFT OPEN AFTER PARTIAL REMOVAL.
- 2. ALL EXISTING FLOOR OPENINGS WHERE PIPE IS REMOVED SHALL BE PATCHED TO MATCH EXISTING FLOOR. MAINTAIN BLDG. FIRE RATING BY THE PC.
- FIELD VERIFY ALL EXISTING PIPE LOCATIONS, SIZES, AND INVERTS. THIS IS TO INCLUDE ALL COLD, HOT, AND HOT WATER RETURN PIPING, DRAIN WASTE AND VENT PIPING.
- 4. ASSOCIATED PIPING INCLUDES DRAIN, WASTE, VENT, HOT, HOT WATER RETURN, AND COLD WATER LINES.
- 5. ALL LINES THAT ARE TO BE REMOVED SHALL BE CAPPED AT A MAIN LINE, RISERS AND STACKS.



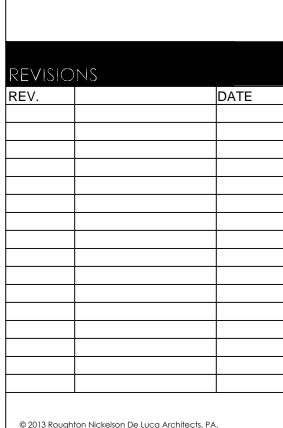
P.D.I. SYMBOL	FIXTURE UNIT RATING	A SIZE
Α	1–11	1/2
В	12-32	3/4
С	33–60	1
D	61–113	1 1/4
E	114–154	1 1/2
F	155-330	2











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RECOMMEND APPROVAL Chief of Service:

Plumbing Plans Approved Chief, Engineering Svc

APPROVED BY: MEDICAL CENTER DIRECTOR

Replace Boiler Plant Generator WBF CTC 7&9

VAMC - Durham 508 Fulton Street Durham, North Carolina

06-21-2013 558-11-102FCA 13-E-07 DRAWING NO. P101





				DUCTI	LESS S	SPLIT SYST	EM SC	HEDULE						
				COOLING CA	PACITY	HEATING	CAPAC	YTY		E	LECTRIC	AL DATA		
DESIGNATION	MANUF.	MODEL NO.	CFM		1 70111					AHU			CU	
DEGISTATION	MAINOF.	MODEL NO.	CITM	TOTAL BTUH	SEER	TOTAL BTUH	AUX. KW	HSPF	VOLTAGE	FLA	WATTS	VOLTAGE	AMPS	MOCP
AHU-1/CU-1	SANYO	KHS0971/CH0971	282	9,000	16	12,200	NA	7.7	POWERED FROM OUTDOOR UNIT	_	_	115/1ø	10.3	20
AHU-2/CU-2	SANYO	KS2472/CL2472	600	24,200	17	-	ı	-	POWERED FROM OUTDOOR UNIT	_	_	208/1ø	12.1	20

1. PROVIDE LOW AMBIENT CONTROLS FOR CU-2. 2. PROVIDE EQUIPMENT PAD FOR CONDENSING UNIT.

HVAC GENERAL NOTES

1.0 GENERAL:

- 1.1. Provide all work, equipment, services, labor, and materials necessary for the construction of new mechanical systems as described or implied by the contract documents.
- 1.2. The drawings are diagrammatic and are not intended to include every detail of construction, materials, and equipment. Take actual field measurements at the job site in lieu of scaling the
- 1.3. Review the contract documents of all trades and coordinate all work with the other trades as necessary to avoid conflicts and interferences.
- 1.4. Visit the site of this project and become thoroughly familiar with all existing field conditions.
- 1.5. All work and materials shall comply with applicable state, local, and national codes (including OSHA). Compliance with the latest edition of the North Carolina State Building Code and these specifications shall be the absolute minimum standard of acceptance.
- 1.6. Obtain and pay for any and all required permits.

for a complete and total installation.

- 1.7. Locations shown for ductwork, equipment, piping, valves, devices, etc., are diagrammatic. Adjustments in these locations shall be made by the Contractor to fully coordinate with the space conditions. Install all equipment so that all code-required and manufacturerrecommended servicing clearances are maintained.
- 1.8. Provide only new materials and equipment listed and labeled (for the use intended) by an approved third party laboratory service such as Underwriter's Laboratories, Inc.
- 1.9. Submit shop drawings and catalog data in six (6) copies for air distribution, insulation, and equipment.

2.0 PIPING AND PIPE FITTINGS:

2.1 Pressure test all piping. Test results shall demonstrate no leaks or appreciable loss of pressure. Repair or replace defective piping until tests are accomplished successfully.

3.0 MECHANICAL EQUIPMENT:

- 3.1. Provide HVAC equipment as scheduled on the drawings. Include all appurtenances necessary
- 3.2. Install all equipment and controls so that the installation meets the requirements of the equipment manufacturer.

4.0 PROJECT CLOSEOUT

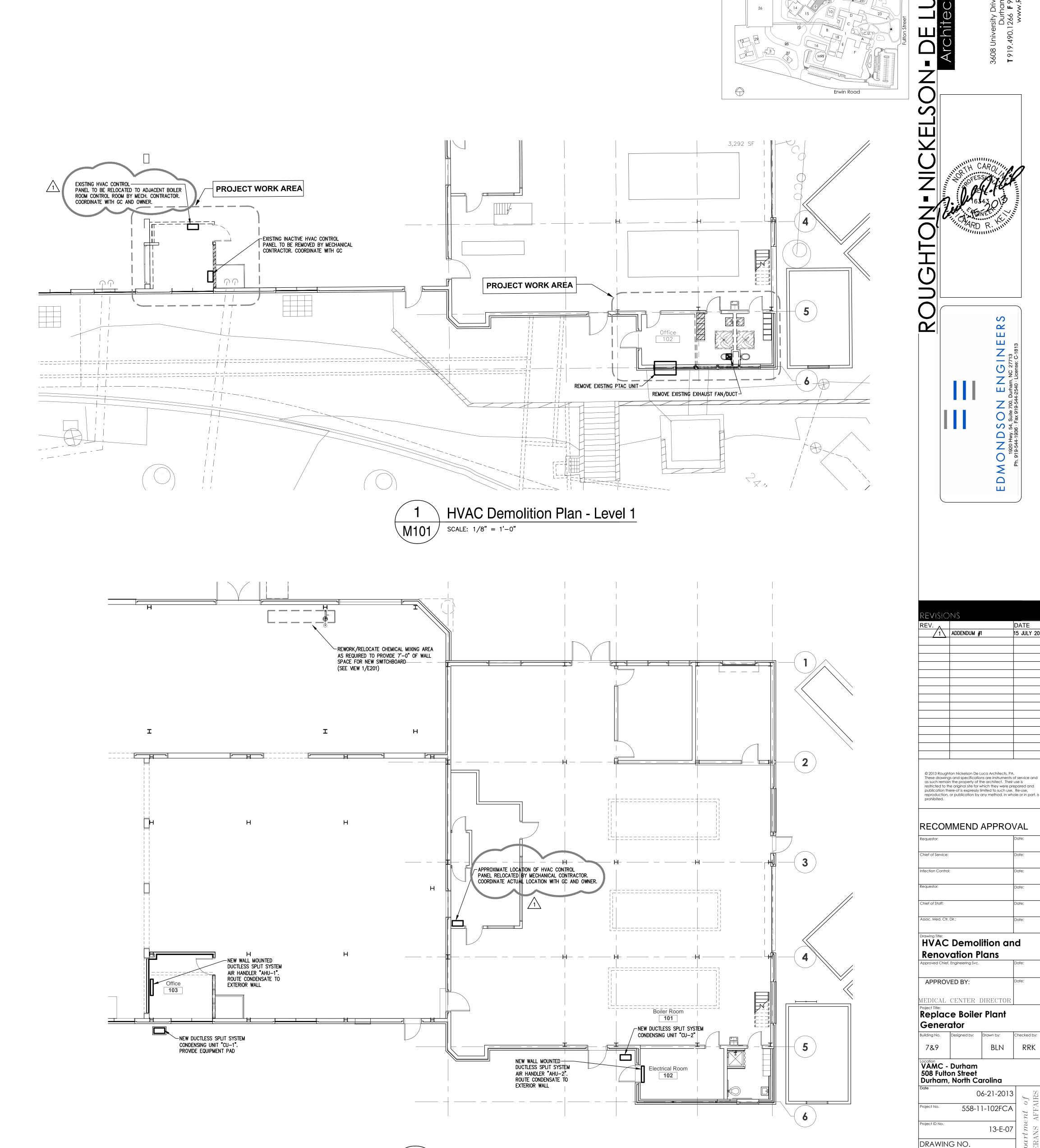
- 4.1. Prior to end of construction, furnish to the Engineer four (4) bound and indexed sets of maintenance and operating instructions, parts lists, electrical wiring diagrams, balance data, and manufacturer's literature sufficient for operation and complete maintenance of all equipment by the Owner. Approved submittals and shop drawings may be included in the Maintenance Manuals instead of being separately furnished, if desired.
- 4.2. Manuals shall be durably bound and clearly identified on the front cover (and on the spine of thick volumes). Identification shall include the building or project name, project number, applicable trade, approximate date of completion (month and year) and contractor's name.
- 4.3. Manuals shall be organized into well defined and easy to locate sections, with index tabs or separators to divide the sections. A complete table of contents shall be provided at the front indicating the section or page number for each system, subsystem, or supplier/manufacturer.
- 4.4. Catalog data and cuts shall be clearly marked to indicate model numbers, sizes, capacities, operating points, and other characteristics of each item used. This should include accessories or special features provided. Where various sizes or variations of a series or model are used, documents should clearly show which are used where. Maintenance literature shall include complete information for identifying and ordering replacement parts, such as illustrated parts

5.0 INSTRUCTIONS TO OWNER:

- 5.1. Conduct a maintenance and operational instruction session for the Owner.
- 6.0 INTERRUPTION OF SERVICES:

breakdowns.

6.1. Schedule any and all interruptions of services with the Engineering office and building owner. All such interruptions and "tie in" to existing systems shall be performed without shutting down the



Key Plan

EERS

APPROVED BY:

7&9

BLN RRK

06-21-2013

13-E-07

558-11-102FCA

M101

Sheet of

HVAC Renovation Plan - Level 1 M101 SCALE: 1/8" = 1'-0"

VA ELECTRICAL DEFICIENCIES PHASING NOTES:

- 1. ORDER NEW 2MW GENERATOR.
- 2. PREPARE NEW BOILER PLANT ELECTRICAL ROOM.
- 3. INSTALL NEW BOILER PLANT ELECTRICAL GEAR.
- 4. INSTALL NEW CHILLER PLANT ELECTRICAL GEAR.
- 5. PREPARE NEW GENERATOR PAD AND INSTALL UG CONDUIT.
- 6. INSTALL NEW BOILER PLANT AND CHILLER PLANT FEEDER CONDUITS AS COMPLETE AS POSSIBLE TO MINIMIZE CUTOVER TIMES.
- 7. BOILER PLANT CUTOVER NORMAL POWER SERVICE ENTRANCE TO NEW SERVICE RATED ECB1.

 NOTE: SCHEDULED AFTER HOURS OUTAGE TO BE COORDINATED WITH VAMC. 72 HOUR NOTICE IS REQUIRED FOR
- ALL OUTAGES. USE EXISTING GENERATOR TO SUPPLY CRITICAL EMERGENCY LOADS FROM EXISTING EMERGENCY SWITCHBOARD AND EMERGENCY PANEL DURING OUTAGE (SEE RISER)

 8. PROVIDE A TEMPORARY NORMAL POWER FEED FROM NEW MDP TO EXISTING ATS TO MAINTAIN A NORMAL POWER

SOURCE SO THAT CRITICAL LOADS CAN BE REROUTED TO NEW PANEL MDP IN AN ORDERLY FASHION WHILE MINIMIZING

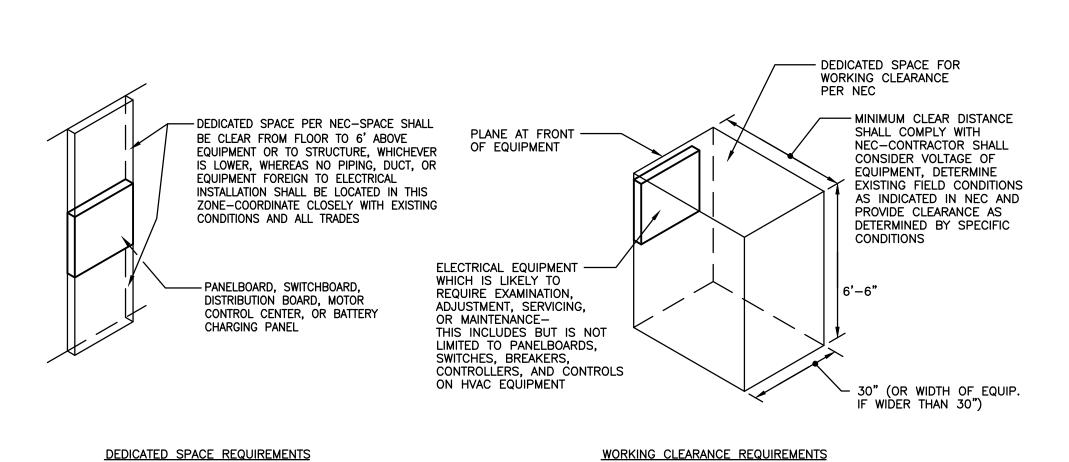
- 9. INSTALL NEW 2MW GENERATOR WHEN AVAILABLE.
- 10. INSTALL NEW EMERGENCY FEEDERS TO NEW ATS'S AND ECB2.
- 11. STARTUP AND TEST NEW 2MW GENERATOR.
- 12. CUTOVER BOILER PLANT EMERGENCY FEEDERS TO NEW MDP. EACH FEEDER CUTOVER TO BE SCHEDULED AND COORDINATED WITH VAMC FOR AFTER HOURS OUTAGE. 72 HOUR NOTICE IS REQUIRED.
- 13. ONCE ALL EXISTING BOILER PLANT EMERGENCY FEEDERS ARE CUTOVER TO NEW GENERATOR VIA NEW MDP, DEMOLISH EXISTING EMERGENCY GENERATOR CIRCUITS AND DISTRIBUTION EQUIPMENT AND ABANDON GENERATOR IN PLACE. TURN OVER ATS TO VAMC.
- 14. REWORK MCC FEEDERS.
- 15. REWORK CHILLER #3 FEEDERS.

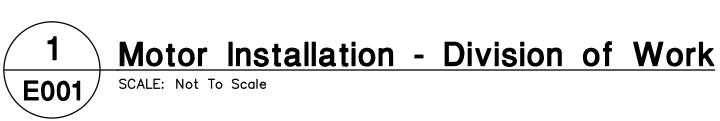
GENERAL ELECTRICAL DEMOLITION NOTES:

- 1. THE ELECTRICAL CONTRACTOR SHALL REMOVE ONLY THOSE EXISTING DEVICES AND ASSOCIATED ELECTRICAL CONDUIT AND WIRING AS INDICATED ON DEMOLITION DRAWINGS. THE ELECTRICAL CONTRACTOR SHALL DISCONNECT SERVICES TO THIS EQUIPMENT FOR REMOVAL BY THE GENERAL CONTRACTOR. COORDINATE THE DISCONNECTION AND DEMOLITION OF EQUIPMENT CLOSELY WITH THE GENERAL CONTRACTOR. DEVICES NOT INDICATED ON DRAWINGS ARE TO REMAIN UNLESS NOTED OTHERWISE.
- 2. REMOVE POWER AND SIGNALING SYSTEMS WIRING AND RACEWAY WHICH SERVES DEVICES/EQUIPMENT BEING REMOVED COMPLETE BACK TO SOURCE OR BACK TO THE POINT WHERE CIRCUITRY REMAINS TO CONTINUE SERVING EXISTING ITEMS NOT BEING DEMOLISHED. RECONNECT AND EXTEND CIRCUITRY AS REQUIRED TO MAINTAIN POWER AND SIGNALING SERVICES TO ALL REMAINING EQUIPMENT. ALL REMAINING PULL, OUTLET AND JUNCTION BOXES SHALL BE ACCESSIBLE AFTER RENOVATION WORK IS COMPLETED.
- 3. COORDINATE ANY AND ALL WORK WITH ALL OTHER TRADES PRIOR TO DEMOLITION AS REQUIRED TO AVOID
- 4. ALL PANEL DIRECTORIES SHALL BE UPDATED TO INDICATE EQUIPMENT SERVED AND ROOM NUMBER. SPARES AND SPACES SHALL BE LABELED AS SUCH. DIRECTORIES SHALL BE TYPED. OLD DIRECTORIES SHALL BE TURNED OVER TO THE OWNER.
- 5. THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS IN ORDER TO OBTAIN A FULL UNDERSTANDING OF WORK TO BE DONE. THE CONTRACTOR SHALL INSPECT AND OBSERVE THE EXISTING SITE, BUILDING, STRUCTURAL, PLUMBING, MECHANICAL AND ELECTRICAL CONDITIONS PRIOR TO BEGINNING DEMOLITION AND SHALL PERFORM HIS WORK IN A MANNER TO ACCOMMODATE THESE EXISTING CONDITIONS.
- 6. THE ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT DEMOLITION AREA WITH ARCHITECTURAL PLANS PRIOR TO BEGINNING WORK.
- 7. ALL EXISTING POWER PANELS SHOWN ON DEMOLITION PLANS TO REMAIN SHALL BE PROTECTED DURING ALL PHASES OF DEMOLITION. PANELS SHALL BE CLEANED AFTER CONSTRUCTION.
- 8. WHERE DEVICES ARE REMOVED IN AN EXISTING WALL TO REMAIN, PROVIDE BLANK STAINLESS STEEL COVER
- 9. THE EQUIPMENT BEING REWORKED IN THIS PROJECT FEEDS THE HOSPITALS MAIN HEATING AND COOLING SYSTEMS AND OTHER CRITICAL FUNCTIONS.. SHUTDOWNS AND SERVICE INTERRUPTIONS SHALL BE COORDINATED WITH OTHER TRADES AND VA MEDICAL CENTER ENGINEERING STAFF AT LEAST ONE WEEK IN ADVANCE OF EXPECTED SHUTDOWN TO MINIMIZE IMPACT TO FACILITY OPERATIONS. POWER INTERRUPTIONS SHALL BE SCHEDULED FOR AFTER HOURS AND WEEKENDS. EXTENDED INTERRUPTIONS WILL REQUIRE PROVISIONS FOR TEMPORARY POWER.

GENERAL ELECTRICAL NOTES:

- 1. THE CONTRACTOR SHALL VERIFY EQUIPMENT NAMEPLATE INFORMATION BEFORE INSTALLING CONDUIT, WIRING, CIRCUIT BREAKERS, DISCONNECT SWITCHES OR FUSES.
- 2. IN THE EVENT THE CONTRACTOR CHOOSES TO USE PRODUCTS OTHER THAN THE BASIS OF DESIGN, HE ASSUMES FULL RESPONSIBILITY FOR COORDINATION AND INTEGRATION OF SUCH ITEMS. VOLTAGES, LOADS, WRE SIZES AND QUANTITIES, DISCONNECT SWITCHES AND FUSE SIZES, PHYSICAL SIZE, LOCATIONS, CLEARANCES, ETC. SHALL BE FULLY COORDINATED BY THE ELECTRICAL CONTRACTOR AND SHALL BE HIS RESPONSIBILITY. ANY ADDITIONAL COST RESULTING FROM SAID SUBSTITUTION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 3. ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER THE ELECTRICAL DRAWINGS REGARDING BUILDING CONSTRUCTION, DIMENSION AND ARRANGEMENT. LINES THAT REQUIRE SLOPE, SUCH AS PLUMBING WASTE LINES SHALL TAKE PRECEDENCE OVER ELECTRICAL LINES. CONTRACTOR SHALL COORDINATE CLOSELY WITH ALL TRADES TO AVOID CONFLICTS AND SHALL PROVIDE ALL OFFSETS AND EQUIPMENT AS REQUIRED TO FIT THE ELECTRICAL WORK INTO THE AVAILABLE SPACE.
- 4. ALL DISCONNECTS SHALL HAVE A GROUND BAR AND A NEUTRAL BAR.
- 5. COORDINATE ANY AND ALL WORK WITH OTHER TRADES PRIOR TO INSTALLATION SO AS TO AVOID CONFLICT DURING CONSTRUCTION.
- 6. ALL PANELS SHALL HAVE TYPED, COMPLETED DIRECTORIES INDICATING EQUIPMENT SERVED AND ROOM NUMBER (AS INDICATED ON FINAL BUILDING ROOM SIGNAGE) OF EQUIPMENT LOCATION, OR SPARE, OR
- 7. THE CONTRACTOR SHOULD READ AND UNDERSTAND THE ENTIRE SET OF CONSTRUCTION DOCUMENTS WHICH INCLUDES BUT IS NOT LIMITED TO THE SPECIFICATIONS, ARCHITECTURAL, CIVIL, STRUCTURAL AND ALL ENGINEERING DRAWINGS, SO THAT HE MAY UNDERSTAND THE FULL SCOPE OF WORK AND CONVEY THE PROPER REQUIRED MATERIALS AND METHODS OF INSTALLATION TO THE ESTIMATORS, SUPPLIERS AND INSTALLERS
- 8. THE CONTRACTOR SHALL INSPECT AND OBSERVE THE EXISTING SITE, BUILDING, STRUCTURAL, PLUMBING, MECHANICAL AND ELECTRICAL CONDITIONS PRIOR TO BEGINNING WORK AND SHALL PROVIDE AND INSTALL FIXTURES, DEVICES AND EQUIPMENT IN A MANNER TO ACCOMMODATE THESE EXISTING CONDITIONS.
- 9. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS IN ORDER TO OBTAIN A FULL UNDERSTANDING OF WORK TO BE DONE.
- 10. NO EXISTING POWER (CIRCUIT BREAKER, DISCONNECT SWITCHES, ETC.) IS TO BE TURNED OFF UNTIL VERIFIED THAT IT IS NOT IN CURRENT USE AND UNTIL APPROVED BY THE OWNER.
- 11. ALL ELECTRICAL EQUIPMENT AND WIRING SHALL BE 75 DEG. RATED.
- 12. FINAL LOCATIONS OF ALL POWER DEVICES SHALL BE COORDINATED WITH FINAL EQUIPMENT PLAN PRIOR TO ROUGH—IN OF ANY LOCATIONS.
- 13. ALL CONDUIT SHALL BE INSTALLED TIGHT TO STRUCTURE, PARALLEL AND PERPENDICULAR TO STRUCTURE. COORDINATE CONDUIT ROUTING WITH EXISTING UTILITIES.
- 14. THE EQUIPMENT BEING REWORKED IN THIS PROJECT FEEDS THE HOSPITALS MAIN HEATING AND COOLING SYSTEMS AND OTHER CRITICAL FUNCTIONS. SHUTDOWNS AND SERVICE INTERRUPTIONS SHALL BE COORDINATED WITH OTHER TRADES AND VA MEDICAL CENTER ENGINEERING STAFF AT LEAST ONE WEEK IN ADVANCE OF EXPECTED SHUTDOWN TO MINIMIZE IMPACT TO FACILITY OPERATIONS. POWER INTERRUPTIONS SHALL BE SCHEDULED FOR AFTER HOURS AND WEEKENDS. EXTENDED INTERRUPTIONS WILL REQUIRE PROVISIONS FOR TEMPORARY POWER.





DISCONNECT/

MATERIALS AND LABOR BY

MOTOR

STARTER

MECH./PLUMBING CONTRACTOR

MATERIALS AND LABOR BY

ELECTRICAL CONTRACTOR

NOTE: ELECTRICAL CONTRACTOR TO VERIFY

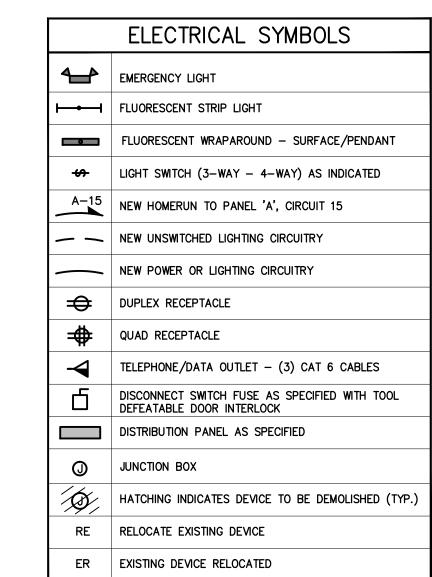
MECHANICAL CONTRACTOR BEFORE

INSTALLING CONDUIT, WIRING, CIRCUIT

EQUIPMENT NAMEPLATE RATINGS WITH

BREAKER, DISCONNECT SWITCH, OR FUSES.



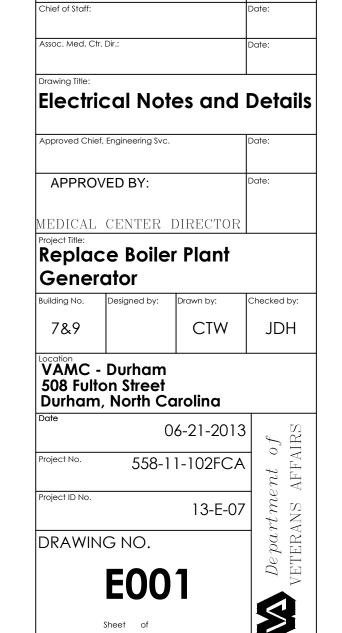


Key Plan

Erwin Road

NOTE:

- ITEMS IN BOLD INDICATE NEW WORK. THIN LINE WEIGHT ITEMS
 INDICATE EXISTING CONDITIONS
- NOT ALL DEVICES ARE IDENTIFIED IN THE LIST ABOVE. REFER
 TO DRAWINGS FOR ADDITIONAL INFORMATION.



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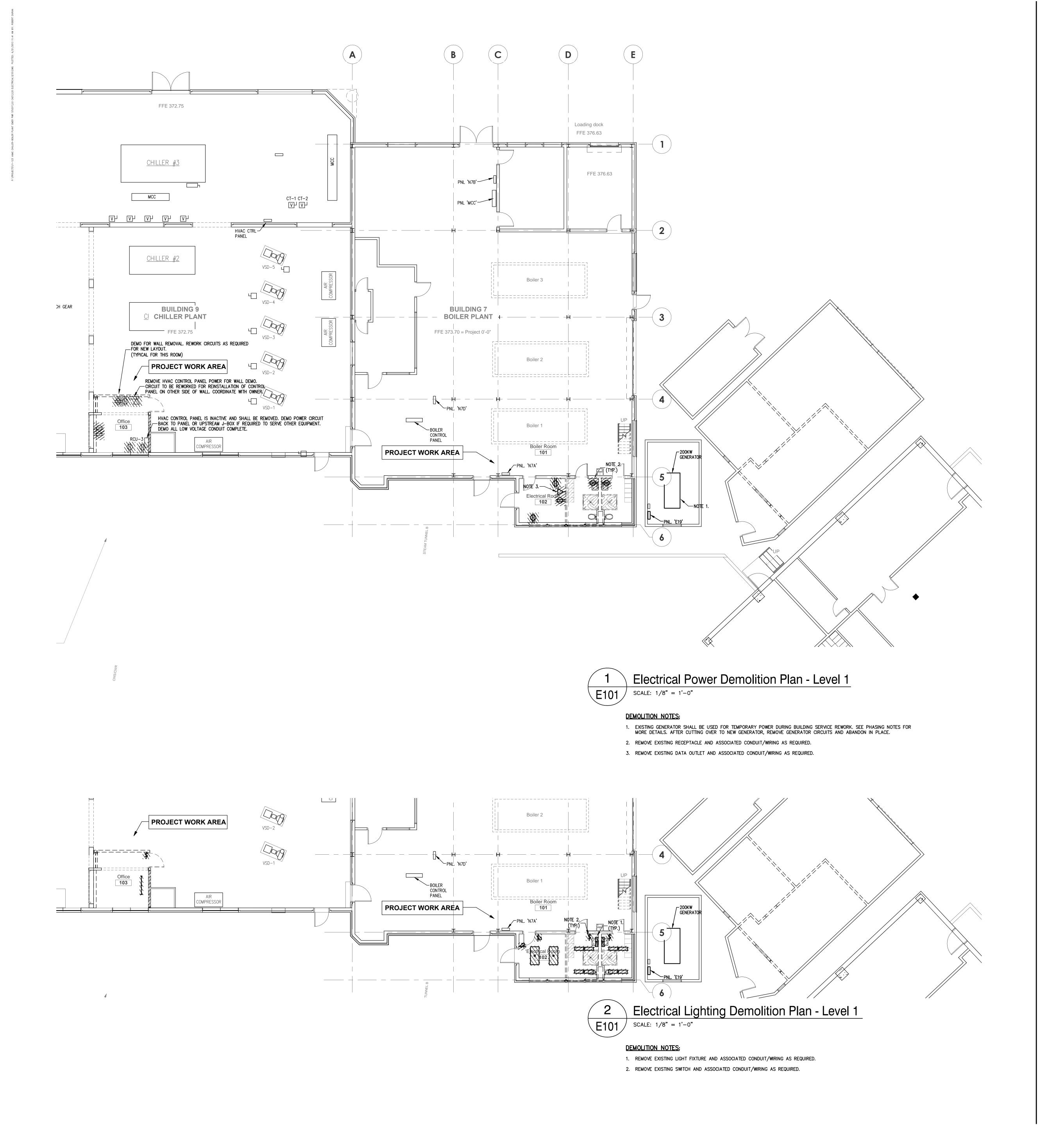
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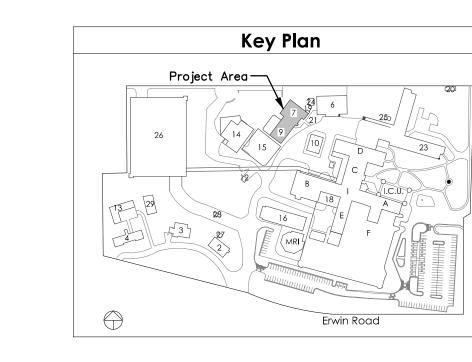
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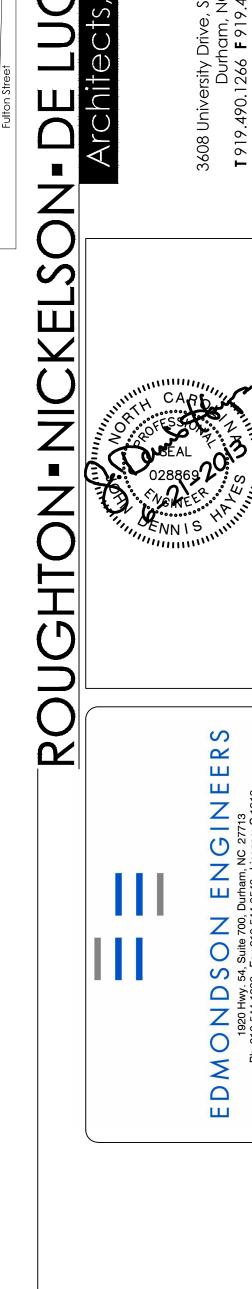
RECOMMEND APPROVAL

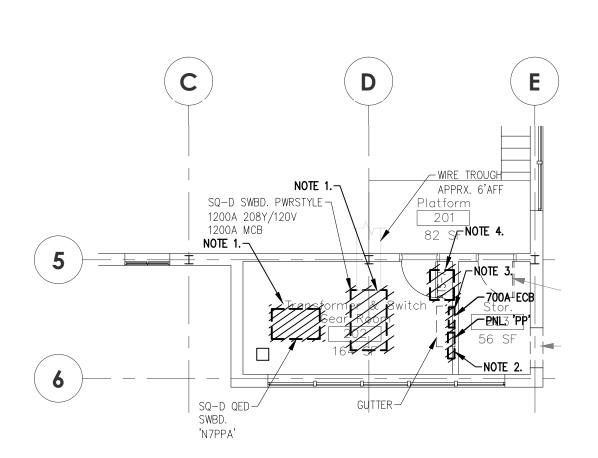
Chief of Service:

nfection Control:









Electrical Power Demolition Plan - Level 2

SCALE: 1/8" = 1'-0"

DEMOLITION NOTES:

REMOVE EXISTING SWITCHBOARD AND ALL ASSOCIATED CONDUIT/WRING AS REQUIRED.
 REMOVE EXISTING PANELBOARD AND ALL ASSOCIATED CONDUIT/WRING AS REQUIRED.
 REMOVE EXISTING ENCLOSED CIRCUIT BREAKER AND ALL ASSOCIATED CONDUIT/WRING AS REQUIRED.
 REMOVE EXSTING ATS AND ALL ASSOCIATED CONDUIT/WRING AS REQUIRED.



approved Chief, Engineering Svc

Generator

DRAWING NO.

7&9

MEDICAL CENTER DIRECTOR

CTW JDH

06-21-2013

13-E-07

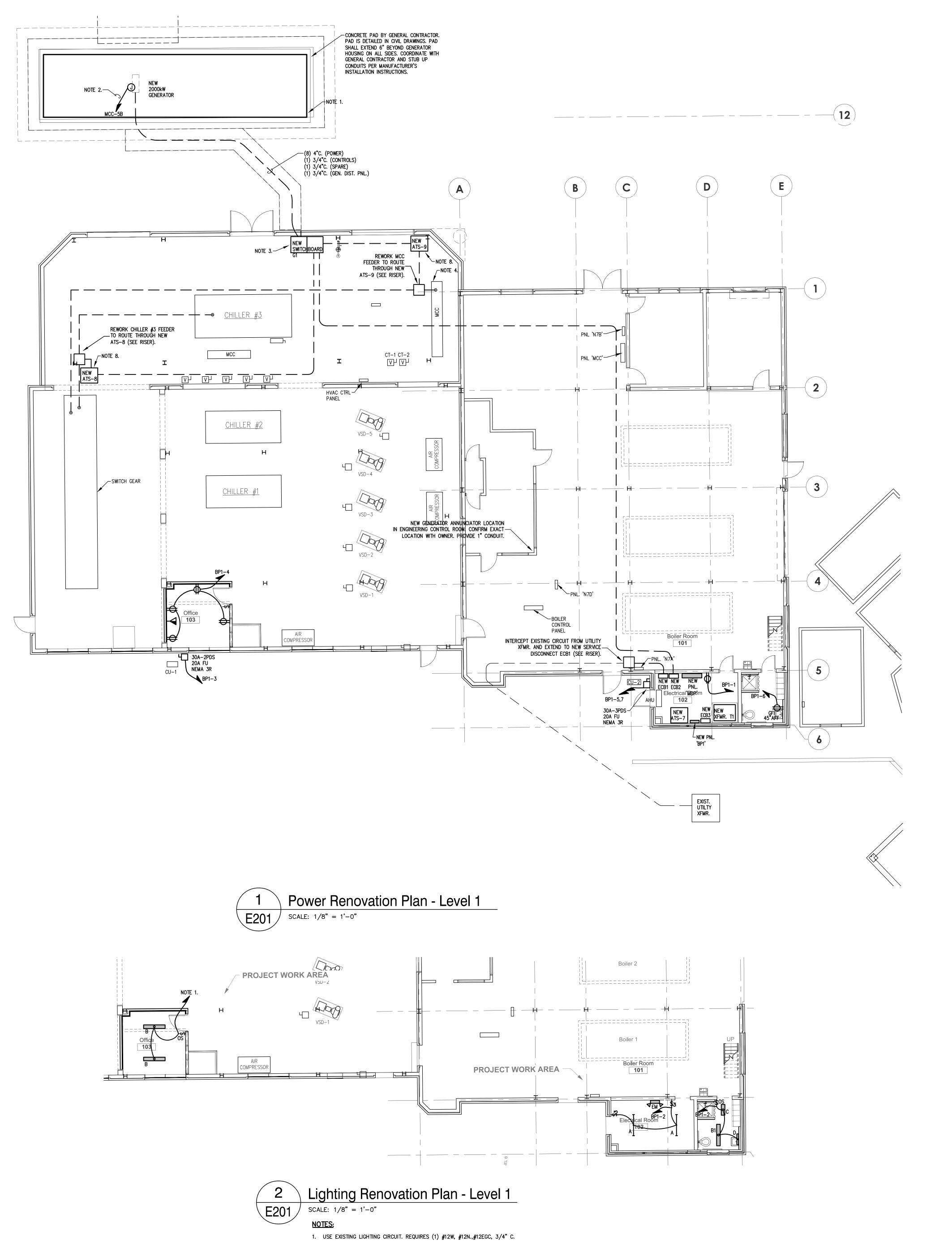
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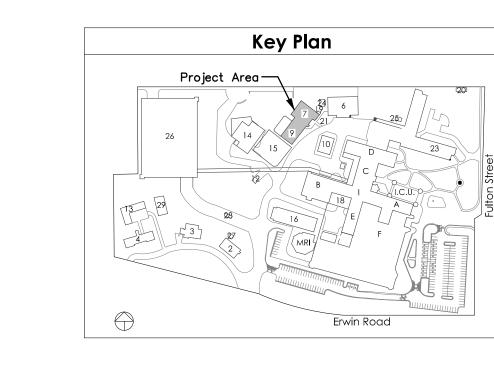
Replace Boiler Plant

VAMC - Durham 508 Fulton Street Durham, North Carolina

E101

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	II	EDMONDSON 1920 Hwy. 54, Suite 700,	Ph. 919-544-1936 · Fax 919-5
REVISIO REV.	1/1/2		DATE

POWER RENOVATION NOTES:

- 1. PURCHASE AND INSTALL NEW 2,000KW GENERATOR AND INSTALL ALL CONDUITS REQUIRED FOR EMERGENCY DISTRIBUTION EQUIPMENT.
- 2. REQUIRES (3) #8W, #10EGC, 3/4"C., 50A-3P CIRCUIT BREAKER.
- 3. INSTALL CHILLER ROOM ELECTRICAL DISTRIBUTION EQUIPMENT INCLUDING: 3.1. NEW GENERATOR DISTRIBUTION SWITCHBOARD.
- 3.2. NEW ATS FOR LARGE CHILLER (#3).
 3.3. NEW ATS FOR CHILLER PLANT MOTOR CONTROL CENTER.
- 4. PROVIDE NEW BUCKET WITH 50A-3P THERMAL-MAGNETIC CIRCUIT BREAKER TO FEED NEW GENERATOR DISTRIBUTION PANEL.
- 5. AS MUCH NEW WORK AS POSSIBLE SHALL BE COMPLETED PRIOR TO DISCONNECTING EXISTING CIRCUITS IN ORDER TO LIMIT DOWNTIME OF CHILLER PLANT.
- 6. ALL WORK WILL NEED TO BE CLOSELY COORDINATED WITH THE OWNER AND POWER OUTAGES WILL NEED TO BE SCHEDULED FOR AFTER HOURS AND WEEKENDS.
- 7. EXTENDED DOWNTIME OF MOTOR CONTROL CENTER WILL REQUIRE TEMPORARY POWER TO MAINTAIN COOLING TO HOSPITAL.
- 8. SEE VIEW 2/E301 FOR ALTERNATE DEDUCT 1.

PE	DESCRIPTION	THE PART OF THE PA				1 3/ (3)	
	HEAVY DUTY STRIP, THREE LAMP 4' FIXTURE.	MANUFACTURER LITHONIA	CATALOG NO. EJ-3-32-120-2G2EJ	LAMPING	90	VOLT	REMARKS PROVIDE WITH WIREGUARD, ELECTRONIC BALLAST
Α	HEAVY DUTY STRIP, THREE DAVIP 4 FIXTURE.	LITHONIA	E0-0-02-120-2G2E0	(3) 320016	90	120	PROVIDE WITH WIREGOARD, ELECTRONIC BALLAST
	4' LOW-PROFILE WRAPAROUND, 10" WIDE, ACRYLIC LENS	LITHONIA	LB-2-32-120- MVOLT	(2) 32WT8	60		STEM MOUNT, EXACT LOCATION OF LIGHT TO BE FIELD COORDINATED TO AVOID EXISTING PIPES
В							
	4' LOW-PROFILE WRAPAROUND, 10" WIDE, ACRYLIC LENS	LITHONIA	LB-2-32-120	(2) 32WT8	60	120	SURFACE MOUNT
B1							
	4' LOW-PROFILE WRAPAROUND, 10" WIDE, ACRYLIC LENS	LITHONIA	LB-2-17-120	(2) 17WT8	32	120	SURFACE MOUNT
С							
	2' PREMIUM WALL BRACKET, ACRYLIC LENS	LITHONIA	WP-2-17-120	(2) 17WT8	32	120	
D							
	DUAL-LITE PG-W LED EMERGENCY LIGHT MOUNTED 96" AFF. POWER FROM UNSWITCHED AREA LIGHTING CIRCUIT.	DUAL-LITE	PG-W	(4) HIGH OUTPUT LEDs	Γ 17	120	CIRCUIT TO LINE SIDE OF LOCAL SWITCH
EM							

1. FIXTURES SHALL BE APPROVED WITH ALL NECESSARY MOUNTING HARDWARE, OPTIONS, AND COMPONENTS AS REQUIRED FOR THE INSTALLATION AND AS DESCRIBED IN THE SPECIFICATIONS.

ALL FLUORESCENT FIXTURES WITH LINEAR LAMPS SHALL HAVE ELECTRONIC BALLAST WITH TOTAL HARMONIC DISTORTION OF LESS THAN 10%, POWER FACTOR GREATER THAN .95, BALLAST FACTOR GREATER THAN OR EQUAL TO .90, AND SHALL BE 'CBM CERTIFIED'. BALLASTS SHALL BE RAPID START AND SHALL BE PARALLEL WIRED IN THREE AND FOUR LAMP VERSIONS.

3. ALL FLUORESCENT LAMPS TO BE 3500K AND SHALL HAVE A CRI RATING OF AT LEAST 85.

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RECOMMEND APPROVAL Chief of Service: nfection Control:

Electrical Renovation Plans

approved Chief, Engineering Svc APPROVED BY:

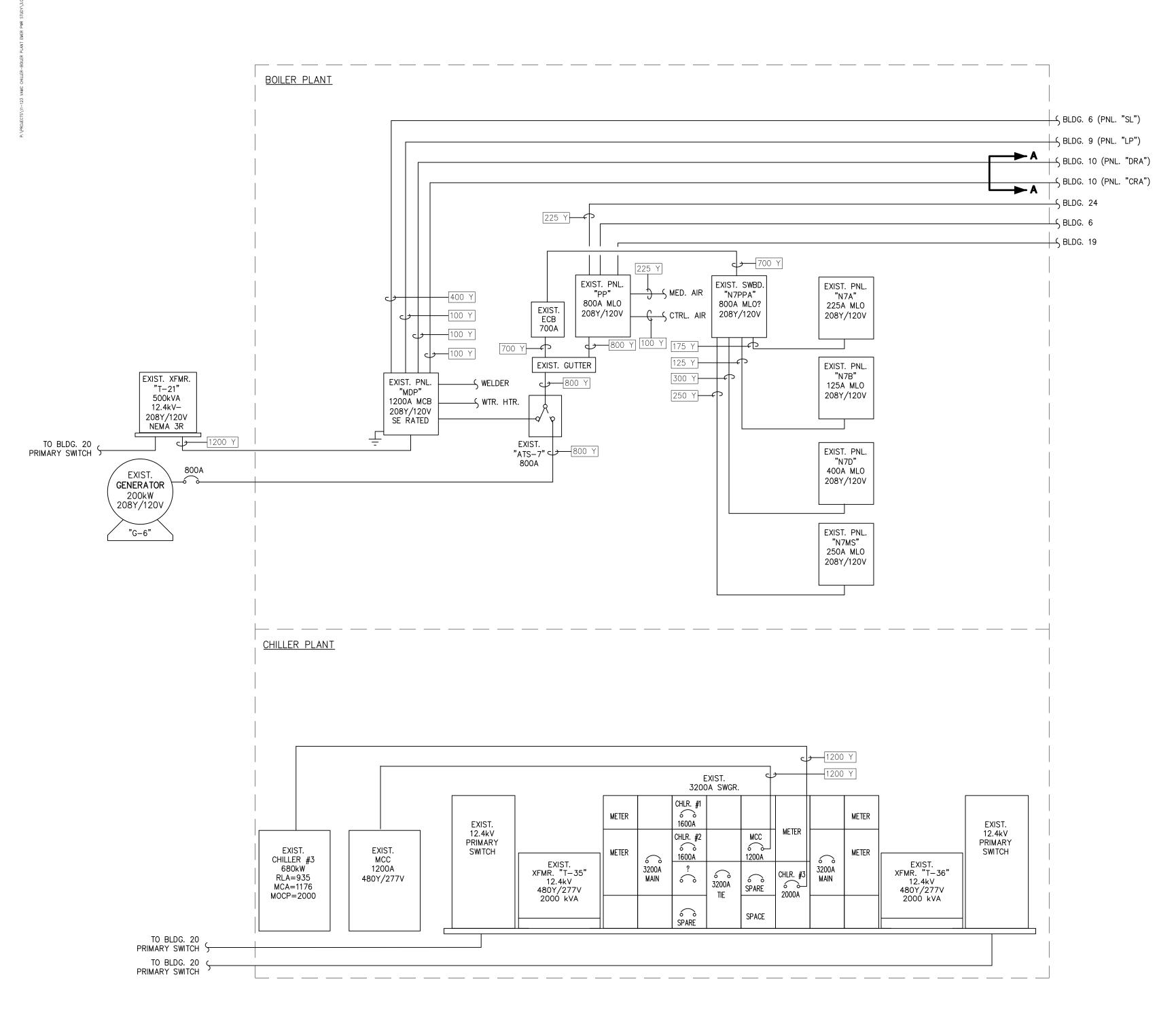
MEDICAL CENTER DIRECTOR Replace Boiler Plant

Generator CTW JDH

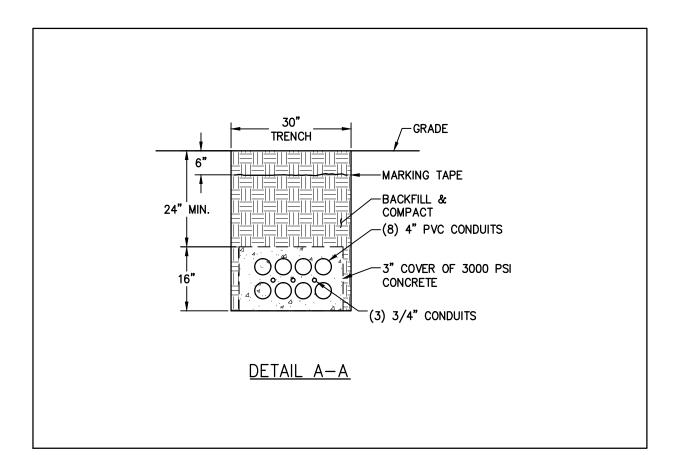
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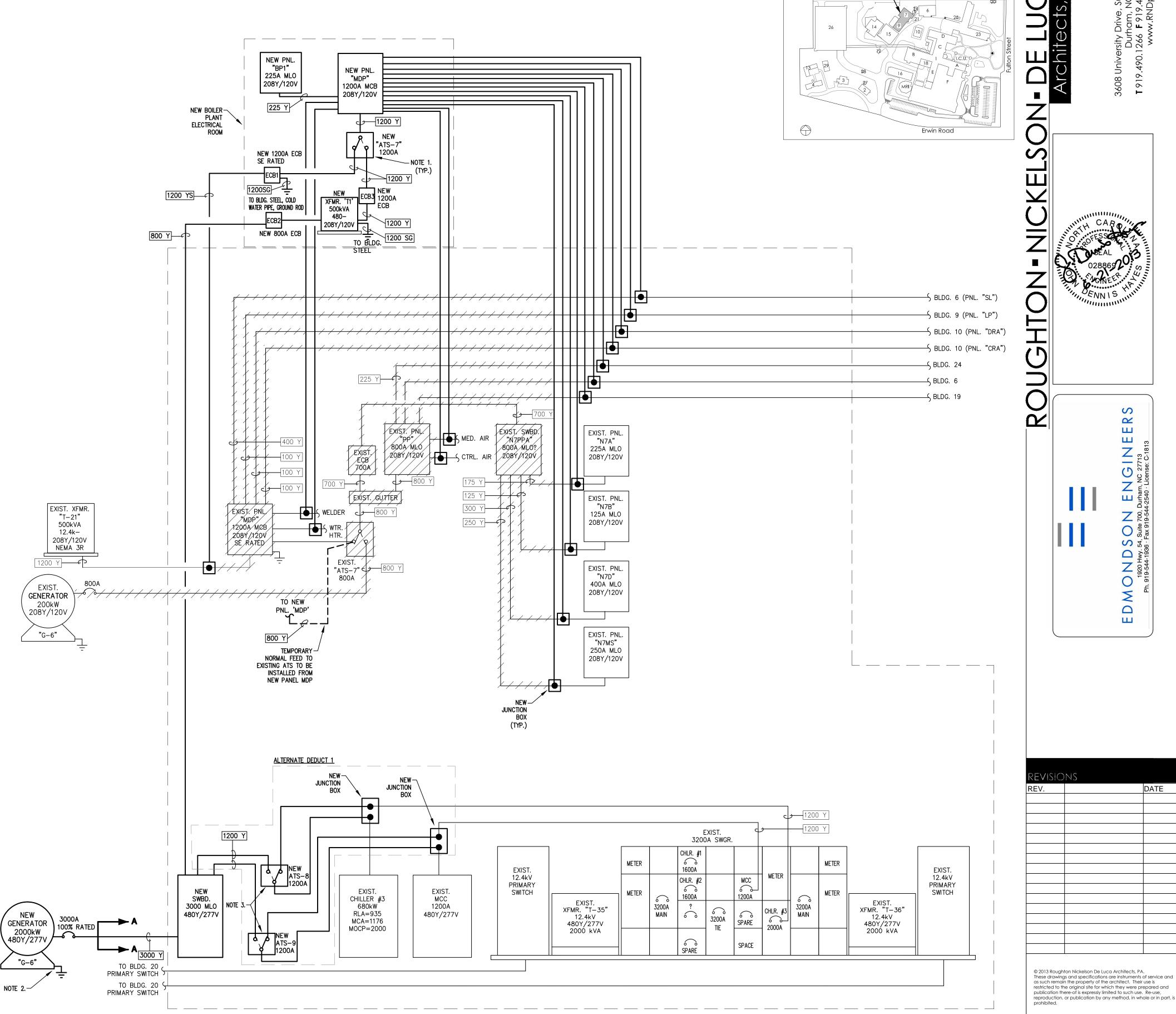














- 1. ALL ATS'S SHALL BE 4-POLE.
- 2. GENERATOR SHALL BE WIRED AS SEPARATELY DERIVED SYSTEM. 3. ALTERNATE DEDUCT 1: DELETE ATS-8 AND ATS-9 AND ALL ASSOCIATED CONDUIT AND WIRING.

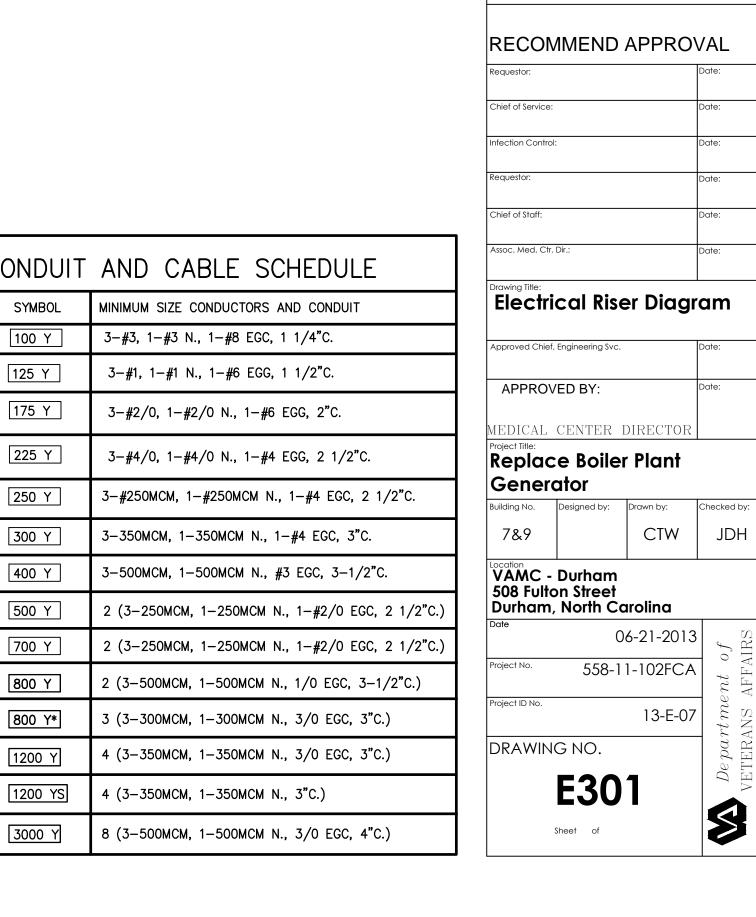
SERVICE	GROUND SCHEDULE
SYMBOL	MINIMUM SIZE CONDUCTORS AND CONDUIT
1200 SG	1-#3/0G, 3/4"C.

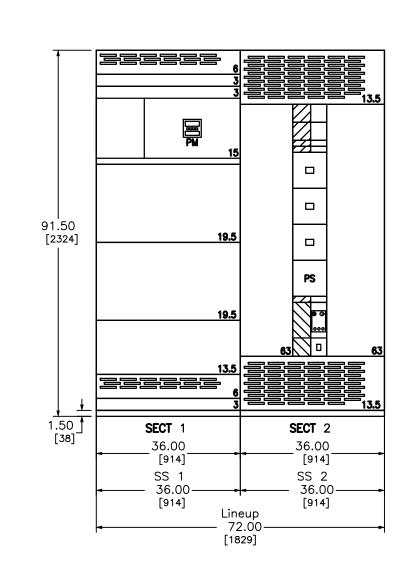
CONDUIT	AND CABLE SCHEDULE
SYMBOL	MINIMUM SIZE CONDUCTORS AND CONDUIT
100 Y	3-#3, 1-#3 N., 1-#8 EGC, 1 1/4°C.
125 Y	3-#1, 1-#1 N., 1-#6 EGG, 1 1/2°C.
175 Y	3-#2/0, 1-#2/0 N., 1-#6 EGG, 2"C.
225 Y	3-#4/0, 1-#4/0 N., 1-#4 EGG, 2 1/2°C.
250 Y	3-#250MCM, 1-#250MCM N., 1-#4 EGC, 2 1/2"C.
300 Y	3-350MCM, 1-350MCM N., 1-#4 EGC, 3"C.
400 Y	3-500MCM, 1-500MCM N., #3 EGC, 3-1/2°C.
500 Y	2 (3-250MCM, 1-250MCM N., 1-#2/0 EGC, 2 1/2°C.)
700 Y	2 (3-250MCM, 1-250MCM N., 1-#2/0 EGC, 2 1/2"C.)
800 Y	2 (3-500MCM, 1-500MCM N., 1/0 EGC, 3-1/2°C.)
800 Y*	3 (3-300MCM, 1-300MCM N., 3/0 EGC, 3"C.)
1200 Y	4 (3-350MCM, 1-350MCM N., 3/0 EGC, 3"C.)
1200 YS	4 (3-350MCM, 1-350MCM N., 3"C.)
3000 Y	8 (3-500MCM, 1-500MCM N., 3/0 EGC, 4"C.)

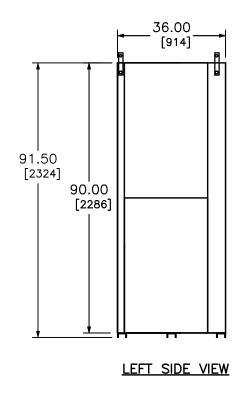
Key Plan

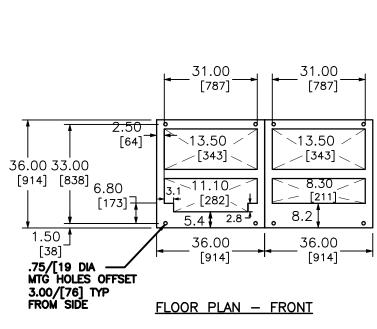
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1920 Hwy. 54, Suite 700, Durham, NC 27713
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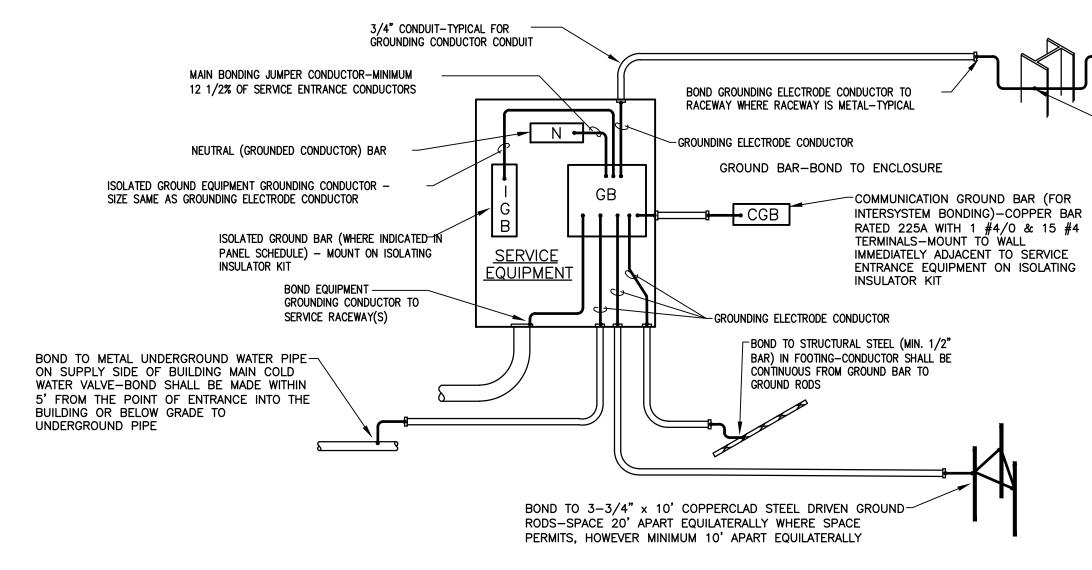




TOP VIEW - FRONT



New Switchboard "G" Dimensions

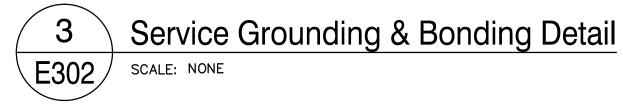


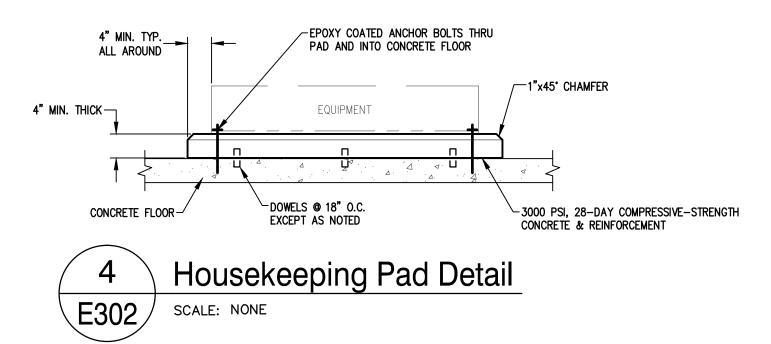
1- GROUNDING CONDUCTORS AND MAIN BONDING JUMPER SHALL BE BARE COPPER UNO AND SHALL BE SIZED AS INDICATED IN ELECTRICAL RISER AND 2- CONNECTIONS TO STRUCTURAL STEEL AND GROUND RODS SHALL BE EXOTHERMIC WELD. 3- GROUNDING ELECTRODE CONDUCTOR CONDUIT SHALL BE SCHEDULE 40 PVC UNO OR REQUIRED OTHERWISE BY NCSBC OR LOCAL AUTHORITY. WHERE CONDUIT IS METAL, BOND CONDUCTOR TO CONDUIT AT EACH END BY MEANS OF A GROUNDING BUSHING. 4- PROVIDE GROUND ROD LENGTH (MINIMUM 10') TO ACHIEVE GROUND ROD RESISTANCE OF LESS THAN 10 OHMS AT SERVICE EQUIPMENT. 5- THE GENERATOR GROUNDING SYSTEM SHALL BE SIMILAR TO THE SERVICE GROUNDING/BONDING DETAIL IN THAT A DEDICATED GROUNDING ELECTRODE CONDUCTOR SHALL EXTEND TO THE STRUCTURAL STEEL IN THE GENERATOR PAD AND THE STEEL STRUCTURAL METAL FRAME OF THE GENERATOR ENCLOSURE-PROVIDE A GROUNDING ELECTRODE CONDUCTOR TO THE SAME THREE GROUND RODS THAT THE BUILDING SERVICE ENTRANCE IS BONDED TO

BOND TO STRUCTURAL STEEL VERTICAL COLUMN (NOT BEAM) OR AN EFFECTIVELY GROUNDED STRUCTURAL METAL MEMBER OF THE

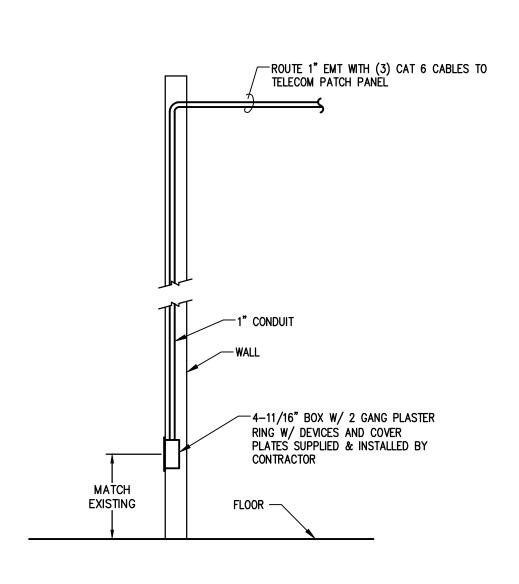
BUILDING-CONDUCTOR SHALL BE CONTINUOUS FROM

GROUND BAR TO WATER PIPING





- . ANCHOR EQUIPMENT TO CONCRETE BASE ACCORDING TO EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS & ACCORDING TO SEISMIC CODES AT PROJECT.
- 2. CONSTRUCT CONCRETE BASES OF DIMENSIONS INDICATED, BUT NOT LESS THAN 4" LARGER IN BOTH DIRECTIONS THAT SUPPORTED UNIT.
- 3. INSTALL DOWEL RODS TO CONNECT CONCRETE BASE TO CONCRETE FLOOR. UNLESS OTHERWISE INDICATED, INSTALL DOWEL RODS ON 18" CENTERS AROUND THE FULL PERIMETER OF THE BASE.
- 4. INSTALL EPOXY COATED ANCHOR BOLTS FOR SUPPORTED EQUIPMENT THAT EXTEND THROUGH CONCRETE BASE & ANCHOR INTO STRUCTURAL CONCRETE FLOOR.
- 5. PLACE & SECURE ANCHORAGE DEVICES. USE SUPPORTED EQUIPMENT MANUFACTURER'S SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, & DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.
- 6. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SUPPORTED EQUIPMENT.
- 7. INSTALL ANCHOR BOLTS ACCORDING TO ANCHOR BOLT MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 8. USE 3000 PSI, 28-DAY COMPRESSION-STRENGTH CONCRETE AND REINFORCEMENT.



Typical Data/Communications Outlet Installation

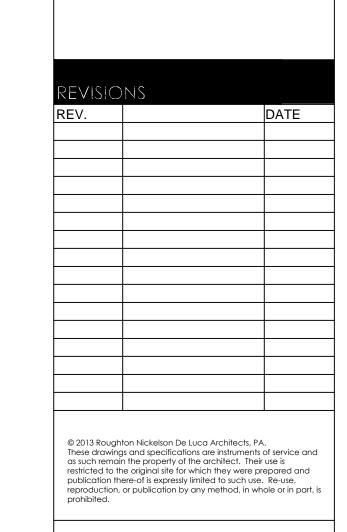
- 1. COORDINATE LOCATION OF TELECOM PATCH PANEL WITH OWNER DURING BIDDING.
- 2. PROVIDE RJ45 DATA JACKS AT DATA OUTLET AND EXISTING PATCH PANEL. OWNER TO PROVIDE PATCH CABLES AND ANY REQUIRED ELECTRONIC EQUIPMENT.
- 3. NO MORE THAN (2) 90 DEGREE BENDS OR 100'-0" BETWEEN PULL BOXES. NO LB FITTINGS.

								NEV	V PANEL	'MDP'								
СКТ	LOAD	DESCRIPTION	COND	EGC	N	W	СВ		LOAD		СВ	W	N	I E	GC COND	DESCRIPTION	LOAD	CK.
1	1000	EXIST. WELDER	3/4"	10		6	60	1000			300		-			EXIST. PNL. 'N7D'		2
3	1000					6	3P		1000		3P	SE	EE F	RISE	₹			4
5	1000					6				1000								6
7		EXIST. WATER HTR.	1"	8		4	70	0			250					EXIST. PNL. 'N7MS'		8
9						4	3P		0		3P	SE	EE F	RISE	₹			10
11						4				0								12
13		EXIST. MED AIR					225	0			400					EXIST. PNL. 'SL'		14
15			SE	E RIS	ER		3P		0		3P	SE	EE F	RISE	₹			16
17										0								18
19		EXIST. CONTROLAIR					100	0			225				_	EXIST. BLDG. 24		20
21			SE	E RIS	ER		3P		0		3P	SE	EE F	RISE	₹			22
23								4-1-		0								24
25		EXIST. PNL 'N7A'					175	1742	4770		225				_	NEWPANEL'BP1'	1742	26
27			SE	E RIS	ER		3P		1776	1400	3P	SE	EEF	RISE	₹		1776	28
29		EWAT DAIL INZDI	<u> </u>				405			1438	000					THE EMERGENCY	1438	30
31		EXIST. PNL 'N7B'		- DIO			125	0			800	0.5		NOF	_	TEMP. EMERGENCY		32
33			SE	E RIS	ER		3P	_	0		3P	St	EEF	RISE	₹	FEEDER		34
35		EVIOT DALL II DI	<u> </u>				400			0						00405		36
37		EXIST. PNL. 'LP'	ا	E DIC	·CD		100 3P	0						_		SPACE		38
39		BLDG. 9	- 55	E RIS	EK		32		0					_				40
41		EMET DAL IDDAL					100			0				_		CDACE		42 44
45		EXIST. PNL 'DRA' BLDG. 10	_ ا	E DIC	CD		3P	0	0					_		SPACE		
47		BLUG. 10	- 35	E RIS	DEK		35		0	0				-				46 48
49		EXIST. PNL. 'CRA'	<u> </u>				100	0		U						SPACE		50
51		BLDG. 10	- 6	E RIS	ED		3P		0							SPACE		52
53		DLDG. 10	- 36	LINIO)LIX		JF.	_	U	0				_				54
55		EXIST. BLDG. 6	1				125	0		U				-+		SPACE		56
57		LAIST. DEDG. 0	ج ا	E RIS	EP		3P		0					-+		STAGE		58
59			-	LINO	LIV		51		U	0				-				60
61		EXIST. BLDG. 19	1"	8		4	70	0		Ü						SPACE		62
63		EMIOT. BEDO. 10		-		4	3P		0					-		OFFICE		64
65			1			4	 			0				_				66
		208	/ 120	VOLT	S		I									FLOOF	R MOUNT	
				BUSS			X	MLO	3	PHASE			SER	VICE	RATED	NEMA		
					ER AMP	S			4	WIRE							(AIC	
				MCB A	AMPS			MCB	X	GROUND BA	R							
NOTES:															AMPS	PHASE TOTALS:	KV	A
1																PHASE A:	2.7	
2																PHASEB:	2.7	
3																PHASE C:	2.4	
4															1-1-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6	TOTAL CONNECTED	7.9	
5															13.26	TOTAL DEMAND	4.7	7

								NE	W PANE	L 'BP1'								
CKT	400	DECEDT EL DIA	0/40	40	40	40		40.4	LOAD		CB	W	N	EGC		DESCRIPTION	LOAD	CKT
1	180	RECEPTEL. RM.	3/4"	12	12	12	20	484	4770		20	12	12	12	3/4"	LIGHTS-EL RM./BATH	304	2
3	1236	CU-1	10.124	12	12	12	20	_	1776	4.400	20	12	12	12	16-10 17-11	RECEPTOFFICE	540	4
5	1258	CU-2	3/4"	12		12	20	4050		1438	20	12	12	12	3/4"	RECEPTBATHRM.	180	6
7	1258	ODADE		-		12	2P	1258			20					SPARE		8
9		SPARE		-			20		0		20					SPARE		10
11		SPARE	-	1						0	20					SPARE		12
13		SPARE					20	0			20					SPARE		14
15		SPARE					20		0		20					SPARE		16
17		SPARE					20			0	20					SPARE		18
19		SPARE					20	0		_	20					SPARE		20
21		SPARE					20		0		20					SPARE		22
23		SPARE	-				20			0	20					SPARE		24
25		SPARE	-	-			20	0			20					SPARE		26
27		SPARE						_	0		20					SPARE		28
29		SPARE					20			0	20					SPARE		30
31		SPARE	-				20	0			20					SPARE		32
33		SPARE					20		.0		20					SPARE		34
35		SPARE					20			0	20					SPARE		36
37		SPARE					20	0	_		20					SPARE		38
39		SPARE					20	_	0	_	20					SPARE		40
41		SPARE	100	<u> </u>		2011011	20			0	20					SPARE		42
			N/A			ROUGH	LUGS									OUDE (OF	NOT WIT	
		208	/ 120	VOLT				111.0		DIAGE			OED) (IV	FDATE	_	SURFACE		
			225		AMPS	0	X	MLO	3	PHASE			SERVIC	ERATE	Ð	NEMA		
				MCB A	R AMP	5		MCB	4 X	WIRE GROUND B	۸D					22K	AIC	
NOTES:				WICD /	TIVIFO			IVIOD		GROUND D	AIX				AMPS	PHASE TOTALS:	KVA	1
		BEEN ADDED TO	LARGES	ST MO	TOR											PHASE A:	1.74	
2	_0 /0 1 // (0	- LLLIT MODED TO		1 100	1 (PHASE B:	1.78	
3																PHASE C:	1.44	
4																TOTAL CONNECTED	4.96	
5															7 3/	TOTAL DEMAND	4.96	3

				NE	W SWI	3D. 'G' (N	MAIN SECT	IION 1 AN	ID DISTRIBU	HON SE	ECTION	12)					
СКТ	LOAD	DESCRIPTION	COND	EGC N	W	СВ		LOAD		СВ	W	N	EGC	COND	DESCRIPTION	LOAD	СКТ
1	258995	CHILLER 3		•		1200	258995			,		•	-		'	•	
	258995		SI	EE RISER		3P		258995									
	258995								258995								
2	166667	XFMR "T1"				800	166667										
	166667	(BOILER PLANT)	SI	EE RISER		3P		166667									
	166667								166667								
3	265920	MCC				1200	265920										
	265920		SI	EE RISER		3P		265920									
	265920								265920								
4		PREPARED SPACE					0										
		(A00A)						0									
									0								
		SURGE PROTECTIVE DEVICE					0										
								0									
									0								
		480.	/ 277	VOLTS												R MOUNT	
			3000	BUSS AMPS		X	MLO	3	PHASE			SERVI	CE RATE	Đ	NEM		
				FEEDER AME	PS .			4	WIRE						65	K AIC	
				MCB AMPS			MCB	X	GROUND BAR	l							
NOTES:		OF THE METERNA													PHASE TOTALS:	KV	
		GFI, TVSS, METERING	ı												PHASE A:	691.	
	BOTTOM	ENTRY PARED SPACES TO INC	NUDE D	EOUIDED II	A DDW	A DE TO	INICTALLE	IITIDE D	DEVNEDO						PHASE B:	691.	
3	ALL PREI	PARED SPACES TO INC	LUDE K	EWUIKED H	AKUW	ARE IO	INSTALLF	UIUKE B	REAKERS						PHASE C:	691. 2074	
4														2490.09	TOTAL CONNECTED	70/4	C1.





RECOMMEND APPROVAL Chief of Service: nfection Control: Assoc. Med. Ctr. Dir.:

Electrical Panel Schedules and Details

APPROVED BY:

MEDICAL CENTER DIRECTOR

Replace Boiler Plant Generator 7&9 CTW JDH

VAMC - Durham 508 Fulton Street

